Department of Technology Management and Innovation  
MG-GY 9753 Design Strategies  
Fall 2019

Professor: Hannah Berkin-Harper

Contact Details: hbh5@nyu.edu

Office/Hours: By Appointment  
5 MetroTech Center, LC401

Class Schedule: Wednesdays 8:35pm-11:05pm  
Rogers Hall, 213

Course Pre-requisites: If you do not already have CAD experience, please work your way through the SolidWorks Help tutorials. SolidWorks is available in the Maker Space, and additionally student licenses are available to purchase but not required.

Course Description:

Designers are most importantly problem solvers who give shape to ideas. Designers need to be knowledgeable of possibilities that already exist, but expansive enough to grasp at ideas and systems that have not yet been imagined.

This course will focus on the industrial design process from research to prototype. This includes researching and establishing user and client needs, developing product specifications, conceptual and visual design, design iteration and prototyping methods, detail design, design for manufacturing, and design for environmental sustainability. We will also draw, make models, develop SolidWorks skills and learn 3D printing techniques.

Each student will be expected to conceptualize and create visual materials. We will look closely at materials and manufacturing to understand some of the external conditions that give shape to an idea, and we will investigate the path of how objects are made, used, consumed, and discarded.

Themes
  • The design process and how it varies between different kinds of businesses from small start-ups to large established companies.
  • Design thinking and its role in the overall design strategy
  • Identifying Needs and Opportunities
  • Establishing Specifications
• **Concept Generation and Development**: We will employ the use of successively refined steps towards resolution of a problem including sketching and model-making.

• **Prototyping and CAD**

  This course will be a combination of workshops, lectures, and in-class working time. We will meet in Rogers 213 but will move class to the Makerspace when needed. Please keep an eye on course announcements through *Classes*. Depending on number of students, the semester long project will either be individual or team projects with the latter being preferred.

**Course Objective:**

• Students will be able to define problems and goals and develop solutions through iterative design process
• Students will be able to communicate the design process using both digital and analog means (research, sketching, model making, CAD)
• Students will be able to apply knowledge of materials and manufacturing processes
• Students will be able to understand and integrate testing and evaluation to the design process
• Students will be able to create and digitally archive work in a meaningful way that tells a story of the design process.
• Students will be able to work in a group

**Course Structure:**

[Insert Course Structure Here]

**Readings:**

- *Product Design and Development* by Karl T. Ulrich and Steven D. Eppinger
- Articles as assigned.
- Download: [https://www.ideo.com/post/design-kit](https://www.ideo.com/post/design-kit)

**Course Assignments and Grading:**

You are expected to come to class on time and prepared to show assignments and talk about your work and progress. I expect you to arrive with clear presentations and articulate descriptions of your ideas. I expect you to participate in discussion and provide feedback to your classmates’ work. Always bring sketch paper and drawing implements to class.

**Semester Assignment Overview: Design for a Morning Routine**

People have varied and ritualistic morning routines. Many people do exactly the same thing in the same order when they wake up. Some people love the morning and cherish their routines, others hate it and are just trying to start the day. Your project will be to analyze first your own morning routine and then someone else’s (ideally who is quite different from you) and to design an object/product for them. The product can be anything from something to help them wake up in the first place (like an
alarm clock) to something to help them prepare their favorite breakfast (a juicer?) to something to keep them organized to start the workday. Think about the senses that people use in the morning: The feeling of stretching as you get out of bed, the taste of the first sip of coffee, the sound of your alarm clock, the way the morning light (or darkness) hits your eyes.

Part 01a: due Wednesday January 31st:
• YOUR morning routine: Please write down the steps of your morning routine. Include as much as you can. Do you like the morning? What is difficult about it? What could be more enjoyable? What products do you use? What is missing? You can share this with the class in any way you want: visual map, list, powerpoint, whatever.

Part 01b: due Wednesday January 31st:
• Create a project proposal giving three choices of people whose morning routines you’d like to look at more closely and design for. Please write down why they are interesting and why you want to focus on them. It should be a person that is somehow different from you but still accessible (you will need to interview them)
• Write a plan for how you plan to conduct your research and what you hope to learn.
• Write each person/ idea of interest on a separate half sheet of standard letter paper large enough top in up on the wall.

Part 02: due Wednesday February 21st (first graded component 10%)
• With your teammate compile primary and secondary research on your user and category. Get as many details of their morning routines as possible. See if you can find similarities between your users. What are points of difference? Make a JOURNEY MAP compiling their morning routines (or select one that is “typical”). Please also include a PERSONA. Evaluate what your users have told you and come up with a list of RANKED NEEDS and OPPORTUNITIES.
• Create a design brief including WHAT you plan to work on based on the needs and opportunities you’ve discovered. It can be vague. Example: advice that helps my user wake up rather than an alarm clock.

Part 03: due Wednesday March 07th
• Please create a MOOD BOARD which will serve as further inspiration for your design. Show products, situations, people that relate to your project. 1 board per team, with multiple images on it.

Part 04: due Wednesday March 21st (second graded component 10%)
First round ideas + Group Critique:
• Show your ideas. You can use 2D and 3D. You can hand sketch (don’t worry about how good your sketches are!) You can use CAD a little. You can make cardboard or other simple models. You will present your team’s 5 BEST ideas. Also due is a stack of any “discarded” ideas. Things not flushed out, things you don’t like. Bring everything!

Part 05: due Wednesday April 11th
• Please take any drawings and models you have completed to your user and review with them. Please take pictures of your user interacting with your model and drawings if they will permit it. Due are images and opinions of your users as well as ideas for what can be improved and/or questions for the class. This feedback will be combined with your color studies as a 5 minute pin-up and review
with the class.

Part 06: due **Wednesday April 18th** (third graded component 10%)
- 2nd round concept due. Model with refinement and changes made. CAD started please show in presentation how your concept has changed from 1st presentation.

Part 07: due **Wednesday April 25th** (fourth graded component 10%)
- Please create a manufacturing plan and a sustainability analysis of your product. You will need to know:
  - What are the parts of your product?
  - What is each part made of?
  - How is it manufactured?
  - Where do you think it could be manufactured?
  - Are there environmentally sustainable alternatives to the materials you’ve chosen?
  - What are the tradeoffs to using those materials?

Projects Due May 09 (25% of grade)
Your group will present your project and all its components. Please tell the story of the project. Final will be presented as a PowerPoint (or other presentation software) and should show each phase of the project, and how you came to your final solution.

Final Project Deliverables Due:
- The story, condensed: What is your project, who are your users, what did they need/want. What is your problem statement etc. Tell a story. What was the process? Show pictures from earlier assignments-concept ideation, user feedback etc.
- Final Product Brief
- Drawings and renderings of your product and its components. At least 3D view and technical drawing with overall dimensions. Sections that show individual components. Show as much detail as you’ve designed.
- 3D model or models. One final model or one “looks like” and one “works like” model depending on what you’re working on.
- Manufacturing plan: What are the final components, how are they manufactured and how are they assembled? What would be an ideal flow? Estimate of production costs.

We will likely have at least one guest in the final presentation so please find a way to explain your project to someone who hasn’t seen it before. You need to tell the story and show the process in a visually compelling way.

**Grading**
Attendance, preparation, and participation: 20% Assignments (4) 60%
Final Project 20%
Please see specific grading requirements on the assignment and final project sheets.
# Course Topic Outline

<table>
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<tr>
<th>Class Date and Topic</th>
<th>Readings, Assignments, &amp; Exams</th>
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<tr>
<td><strong>Week 01_January24</strong></td>
<td><strong>Introduction and Overview</strong></td>
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|                              | **Exercise:** Design Your Morning Routine  
|                              | **Discussion:** Role of the Designer | What is Industrial Design?  
|                              | **Video:** IDEO Shopping Cart                                                                                           |
| **Week 02_January31**        | **Research Overview**                                                                                                                                                                                                                 |
|                              | **Reading Due:** Chapters 1,2  
|                              | **Assignment Due:** Topics of interest  
|                              | **Assignment Due:** YOUR morning routine  
|                              | **Exercise:** Formulating research plan.  
|                              | **Exercise:** Interviews and Surveys.  
|                              | **Exercise:** Team Formation                                                                                           |
| **Week 03_February07**       | **Synthesis**                                                                                                                                                                                                                     |
|                              | **Reading Due:** Chapters 3,5,6, 7  
|                              | 1. [https://www.wired.com/insights/2013/12/human-centered-design-matters/](https://www.wired.com/insights/2013/12/human-centered-design-matters/)  
|                              | 3. [http://www.designkit.org/methods/60](http://www.designkit.org/methods/60)  
|                              | **Topics:** Synthesizing Research | Map making | Personas | Needs and Rankings                                                                 |
| **Week04_February14**        | **Sketching workshop**                                                                                                                                                                                                               |
|                              | Please bring newsprint paper and ballpoint pens.                                                                           |
| **Week05_February21**        | **Research Presentations**                                                                                                                                                                                                          |
|                              | **Reading Due:** Chapter 10, 11  
<p>|                              | <strong>Due:</strong> Research presentations and design briefs due: 10 minutes each. See assignment sheet for specific requirements <strong>(10%)</strong>                                                                                                   |
| <strong>Week06_February28</strong>        | <strong>Good design | Ideation</strong>                                                                                                                                                                                                                      |
|                              | <strong>Due:</strong> Bring 5 things you think are GOOD design and 5 things you think are BAD design. Be ready to talk about why                                                                                                                    |</p>
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<tr>
<th>Week</th>
<th>Event</th>
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<tr>
<td>Week07_March07</td>
<td>Prototyping workshop- Makerspace</td>
<td>Ideaation Session: Please bring paper to sketch on, sketching medium, post-it notes, and sharpies</td>
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<tr>
<td>Week08_March14</td>
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<td>Due: Mood Boards</td>
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<tr>
<td>Week10_March28</td>
<td>SolidWorks Workshop- location TBD</td>
<td>Please have completed ALL of the SolidWorks tutorials in the HELP menu by this date. Thank you!</td>
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<tr>
<td>Week11_April04</td>
<td>Presentation</td>
<td>Due: User feedback presentations. 5-10 minutes each.</td>
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<tr>
<td>Week13_April18</td>
<td>Presentation</td>
<td>2nd round concept due. Please show in presentation how your concept has changed from 1st presentation.</td>
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<tr>
<td>Week14_April25</td>
<td>Working Class</td>
<td>Reading: Chapter 16 and <a href="https://www.housewares.org/pdf/IPPrimer.pdf">https://www.housewares.org/pdf/IPPrimer.pdf</a> Due: Manufacturing plan and sustainability analysis due</td>
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<tr>
<td>Week15_May02</td>
<td>Working Class</td>
<td>Reading Due: Chapter 17, 18: Product Development Management and Economics</td>
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Academic Integrity:

All students are responsible for understanding and complying with the NYU Statement on Academic Integrity.

Academic Integrity for Students at NYU

This policy sets forth core principles and standards with respect to academic integrity for students at New York University. Each school at New York University may establish its own detailed supplemental guidelines for academic integrity, consistent with its own culture, and consistent with the University-wide general guidelines described in this document.

At NYU, a commitment to excellence, fairness, honesty, and respect within and outside the classroom is essential to maintaining the integrity of our community. By accepting membership in this community, students take responsibility for demonstrating these values in their own conduct and for recognizing and supporting these values in others. In turn, these values will create a campus climate that encourages the free exchange of ideas, promotes scholarly excellence through active and creative thought, and allows community members to achieve and be recognized for achieving their highest potential.

In pursuing these goals, NYU expects and requires its students to adhere to the highest standards of scholarship, research and academic conduct. Essential to the process of teaching and learning is the periodic assessment of students' academic progress through measures such as papers, examinations, presentations, and other projects. Academic dishonesty compromises the validity of these assessments as well as the relationship of trust within the community. Students who engage in such behavior will be subject to review and the possible imposition of penalties in accordance with the standards, practices, and procedures of NYU and its colleges and schools. Violations may result in failure on a particular assignment, failure in a course, suspension or expulsion from the University, or other penalties.

Faculty are expected to guide students in understanding other people's ideas, in developing and clarifying their own thinking, and in using and conscientiously acknowledging resources - an increasingly complex endeavor given the current environment of widely available and continually emerging electronic resources. In addition, students come to NYU from diverse educational contexts and may have understandings regarding academic expectations that differ from those at NYU. NYU values and respects all academic traditions; however, while at NYU, students are expected to adhere to the norms and standards of academic integrity espoused by the NYU community and will be assessed in accordance with these standards. Students should ask their professors for guidance regarding these standards as well as style guide preferences for citation of sources for assignments in their courses.
Following are examples of behaviors that compromise the academic and intellectual community of NYU. The list is not exhaustive. Students should consult the websites and guidelines of their individual schools for an extended list of examples and for further clarification.

1. Plagiarism: presenting others’ work without adequate acknowledgement of its source, as though it were one’s own. Plagiarism is a form of fraud. We all stand on the shoulders of others, and we must give credit to the creators of the works that we incorporate into products that we call our own. Some examples of plagiarism:
   - a sequence of words incorporated without quotation marks
   - an unacknowledged passage paraphrased from another's work
   - the use of ideas, sound recordings, computer data or images created by others as though it were one’s own

2. Cheating: deceiving a faculty member or other individual who assess student performance into believing that one’s mastery of a subject or discipline is greater than it is by a range of dishonest methods, including but not limited to:
   - bringing or accessing unauthorized materials during an examination (e.g., notes, books, or other information accessed via cell phones, computers, other technology or any other means)
   - providing assistance to acts of academic misconduct/dishonesty (e.g., sharing copies of exams via cell phones, computers, other technology or any other means, allowing others to copy answers on an exam)
   - submitting the same or substantially similar work in multiple courses, either in the same semester or in a different semester, without the express approval of all instructors
   - submitting work (papers, homework assignments, computer programs, experimental results, artwork, etc.) that was created by another, substantially or in whole, as one's own
   - submitting answers on an exam that were obtained from the work of another person or providing answers or assistance to others during an exam when not explicitly permitted by the instructor
   - submitting evaluations of group members’ work for an assigned group project which misrepresent the work that was performed by another group member
   - altering or forging academic documents, including but not limited to admissions materials, academic records, grade reports, add/drop forms, course registration forms, etc.

3. Any behavior that violates the academic policies set forth by the student’s NYU School, department, or division.

**Moses Center Statement of Disability**
If you are student with a disability who is requesting accommodations, please contact New York University’s Moses Center for Students with Disabilities at 212-998-4980 or mosescsd@nyu.edu. You must be registered with CSD to receive accommodations. Information about the Moses Center can be found at [www.nyu.edu/csd](http://www.nyu.edu/csd). The Moses Center is located at 726 Broadway on the 2nd floor.