4.031 Design Studio: Objects and Interaction

Class Overview
This course is an overview of design as the giving of form, order, and interactivity to the objects that define our daily experience. Instruction follows the path from project to interactive product through lectures, hands-on workshops, and studio assignments. Students will gain an understanding of the overall design process, with an emphasis on design development and constraints, preparing them for work in a studio environment.

Topics include the observation and critique of objects; interaction design and user experience; design methodologies, representation, and source material; current dialogues in design objects and production; economies of scale vs. economies of means; designing for unpredictable human behavior; and the role of technology in design.

This course provides a foundation in prototyping skills such as carpentry, 3D modeling, digital fabrication, electronics, and interaction. Readings and lectures will also provide a technical foundation to enable students to create their products, as well as a foundation in the historical movements and current dialogues in the design, production, and significance of objects.

Project 1: Autoprogettazione
The first project is inspired by Enzo Mari’s book Autoprogettazione. Students will sketch, model and build a furniture piece using simple tools and materials. This will introduce students to a craft of improvisation: making things work with standardized, economical, and often less-than-perfect materials, while working at a human scale. Project 1 will provide a foundation in the design, fabrication and documentation methods that will drive the following projects.

Project 2: Second Skin
The second project focuses on the theme of textiles and wearables. Using 3D modeling, 3D scanning, and 3D printing, students will design and fabricate their own textile materials, explore the relationship between objects and the body, and ultimately design a wearable second skin that augments the body.

Project 3: IRL (“In Real Life”)
The third project is inspired by Susan Kare’s designs of the first Apple Macintosh icons, where she transformed abstract computer concepts into an interface that was familiar and easy to understand. Students will take the reverse path by building interactive, physical objects that embody digital interface concepts, such as swipe, scroll, zoom, etc. This assignment will provide a foundation in electronics and interaction design, as well as strategies for rapidly prototyping and designing tangible user experiences.
4.031 Schedule

**Tentative schedule, some things may change

Project 1: Autoprogettazione (4 weeks)

Week 1  Introduction
9/8  Introduction to course
   Introduction Assignment 1: Autoprogettazione
   Reading: Autoprogettazione
   Assignment: Chair Research

Week 2  Construction
9/13  Shop training
   Construction of Chair Q
9/15  Studio time

Week 3  Concept Development and Drawing
9/20  Critique Completed Chair Q
   Tutorial: Design Drawing
9/22  Critique: Drawing Pin-Up
   Tutorial: 2D drawings to 3D model

Week 4  Modeling and Building
9/27  Desk crit of 3D models
   Studio time
9/29  Studio Time
   Documentation

Week 5  Production and Critique
10/4  Final review project 1

Project 2: Digital Textiles and Wearables (5 weeks)

Week 5  The Structure of Textiles
10/6  textiles lecture
   Tutorial: textile examples in Rhino and Grasshopper
   Assignment: 3D model a digital textile

Week 6  3D Modeling
10/11  Holiday
10/13  desk crits
10/14  deadline for 3D printing final models
due: initial 3D model

Week 7  Digitizing the Body
10/18  review (renderings and 3D prints)
10/20  body scanning exercise
Assignment: develop 3 wearable concepts for a part of the body
(drawings + written description)

Week 8
Wearable Concept + Prototype
10/25 desk crits 10/27 due: concept diagrams

Week 9
Production
11/1 11/3

Week 10
Review
11/8 Final Review Project 2

Project 3: IRL (5 weeks)

Week 10
Warm up and Research
11/10 Introduction assignment 3
Interaction Principles/Theory, History etc...
Tutorial Basic Electronics and Interaction Prototyping

Week 11
Concept Development
11/15 Continue Electronics Tutorial
11/17 Bring concepts to prototype
We will spend class doing fast, cheap and out of control prototyping

Week 12
Prototyping
11/22 Deliver write about concept and present it to class
Start on prototyping plan
11/24 Holiday

Week 13
Production
11/29
12/1

Week 14
Presentation Prep
12/6 Desk Crit
12/8 Desk Crit

Week 15
Project Documentation
12/13

Week 16
Final Review
Learning Objectives
The course is divided into three projects that explore the fundamental skills required in product design today. Students should be able to engage with an increasing level of design research and prototyping through a series of iterative studies and short assignments. Upon completion of this course, the student should have a firm understanding of:

- The structure and flow of a design project (opportunity, survey, questions, research, brief, design development, presentation, working drawings, production, critique);
- Digital and craft-based design and prototyping skills (woodshop, programming and electronics, rapid prototyping and digital fabrication, casting and other plastic techniques);
- Design communication and language;
- Modelmaking, mock-up, and prototyping;
- Design criticism and the role of feedback in design development.

Completion Requirements
Completion of each of the exercises, rigor in process and clarity in representation, as well as the overall progress of the semester (including attendance) will be fundamental to completing the course.

Evaluation Criteria and Grading
The following criteria will be used for the evaluation of student’s work, both in terms of helping their progress and in final grading.

1. Thesis: How clearly is the student articulating the conceptual intentions?
2. Translation of Thesis: How well is the student using their thesis to develop a design response to given problems, interests, or ideas?
3. Appropriateness: How well matched is their choice of representation and prototyping strategy to convey their intentions?
4. Quality: How accomplished are they with drawing, modeling, digital representation, fabrication, etc? To what degree does their product convey what they ought to?
5. Oral Presentation Skills: How clearly are they presenting their ideas orally, whether at their desk, in class discussions, or to a more formal jury?
6. Participation in Discussions: How actively and how constructively are they involved in class discussions, both formally and informally?
7. Response to Criticism: How do they effectively take advantage of criticism from instructors, classmates and outside jurors?
8. Auto-Critical Skills: To what extent are they able to critique their own work regularly and effectively?
A: Excellent - Project surpasses expectations in terms of inventiveness, appropriateness, verbal and visual ability, conceptual rigor, craft, and personal development. Student pursues concepts and techniques above and beyond what is discussed in class.

B: Above Average - Project is thorough, well researched, diligently pursued, and successfully completed. Student pursues ideas and suggestions presented in class and puts in effort to resolve required projects. Project is complete on all levels and demonstrates potential for excellence.

C: Average - Project meets the minimum requirements. Suggestions made in class are not pursued with dedication or rigor. Project is incomplete in one or more areas.

D: Poor - Project is incomplete. Basic skills including graphic skills, model-making skills, verbal clarity or logic of presentation are not level-appropriate. Student does not demonstrate the required design skill and knowledge base.

F: Failure - Project is unresolved. Minimum objectives are not met. Performance is not acceptable. This grade will be assigned when you have excessive unexcused absences.

Grade Distribution
Each of the three projects will count for one third of your grade.

Final Studio Deliverables
Grades will not be posted for students to view on their grade report until their work has been archived. The projects need to be properly prepared and formatted, and delivered to the Archiving TA. Studio TA’s will collect project archives from each student immediately following the review. Detailed requirements and instructions for formatting will be posted to CRON, the Department website, and sent to students at the beginning of the semester.

Academic Integrity + Honesty
MIT’s expectations and policies regarding academic integrity should be read carefully and adhered to diligently:  http://integrity.mit.edu

Studio Culture
Work in the studio will build sequentially. Therefore, your commitment to incremental development on a daily basis is of paramount importance. The demanding nature and pace of studio courses necessitates your regular attendance and requires that deadlines be consistently met. In addition to lowering your grade, late work will prevent you from following the overall structure of the course.

It is important that you take advantage of the studio environment. You have been given a studio space; please use it. Magnification of your development as a designer is made possible by the collective nature of the studio. Working in studio, instead of at home, will allow you to participate in the dialogue of the studio setting. Group reviews are collective for a reason. Each of you has something to gain from your peers.
Since studio is a place for all, it necessitates the careful attention to the needs of everyone in it. Please see your instructors if there are any problems that you are unable to resolve on your own. All spraying of fixative, spray paint or any other substance should be done in the shop. Security is a necessary component for a studio that is accessible to you and your colleagues 24 hours a day, 7 days a week.

**Attendance**

Attendance for the full duration of each studio is mandatory. The studio is an exceptional learning environment that requires your physical presence as well as your intellectual presence. You are allowed three excused absences for the semester. An excused absence is defined as one that was discussed with and approved by the professor at least 24 hours prior to the date of absence, or a family or medical emergency that is confirmed by your physician or a dean in Student Support Services. Absences beyond the three allotted will result in a decrease in your final grade. If you miss six or more studio classes, you will be asked to drop the subject or receive a failing grade.

**Web Presence and Documentation**

Students are expected to keep a blog specifically for this class and visually document and post their assignments, research, prototypes, and any pertinent material on a weekly basis. Their web presence will serve as both a reference for in class teaching and reviews, as well as provide a community for students to exchange and discuss ideas, techniques, and processes. Strategies for visually documenting students’ design work will be presented throughout the semester.

[designobjectsinteraction.wordpress.com](http://designobjectsinteraction.wordpress.com)

**Contact Information**

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