Class Overview:
An advanced product design studio focused on producing a small series of manufactured products. Students will develop products that address specific user needs, propose novel design concepts, prototype iteratively, test functionality and ultimately exhibit their work in a retail context. Stemming from new research and technological developments around MIT, this class will try to imagine the future products that emerge from new materials and machine intelligence. It will provide an in-depth exploration of the design and manufacturing of products, through narrative, form, function, fabrication and their relationship to customers.

Concept Development:
In the first phase of this exercise students will be invited to explore novel methods and experimental technologies developed at MIT or elsewhere as their potential mediums for design innovation. How can scientific discoveries and technological innovations in fields other than design become vehicles for design? For example, how can novel material technologies inspire the conception and production of a design object? How can recent breakthroughs in computation or physics offer a new platform for simulation and representation? How can engineering solutions generate possibilities for fabrication methods? Students are encouraged to draw upon highly experimental techniques and technologies, or make their own cross-disciplinary bridges between seemingly unrelated phenomena and technological methods as sources for design inspiration and innovation.
In the second part of this exercise students will be asked to create a design concept whose material, fabrication or function is based on the research gathered. The overall theme of the studio will focus on the design of future luggage. Students are invited to rethink the concept, design and making of luggage, experimenting with unusual physical phenomena, novel methods and techniques. The goal is to address various aspects of the product ranging from the perceptual properties, shape, material of the shell, aesthetics, function to the production process. At the end of the first exercise students will be asked to present their research and design precedents as well as their final concept for a novel travel device.

**Fabrication & Production:**
The second exercise explores processes of fabrication and production through the making and testing of the proposed product. Students will be asked to further materialize their idea for a novel piece of luggage by producing variations of their idea from the first exercise. The variations will be presented in class through models, prototypes and physical experiments. From these variations, students will continue to refine, develop and experiment. Through fabrication, students can make use of various machines or tools: 3D printing, laser cutting, CNC, woodworking tools etc, or commonly used product design methods such as lamination, casting, and molding, or invent their own experimental processes based on the research and phenomena. After producing many prototypes of their luggage, students will be asked to test and evaluate its use and functionality based on their criteria. The fabrication process, the produced prototypes and the evaluation will be documented and visually/verbally presented at the end of the exercise.

**Presentation & Display:**
The last exercise explores the narrative, display, exhibition, and presentation of the product. Students will refine their designs/prototypes and develop a presentation, display and narrative that addresses their specific users/context. Unlike other design studios that focus only on the conceptualization and fabrication of the design object, this advanced studio places great emphasis on the final result and narrative/context of the design. The design of the product’s display and “packaging” is as important as the design and fabrication of the product. To communicate their ideas to users, students will have to compose a narrative regarding the concept, making and/or use of the product. What is the vision behind this novel piece of luggage? Who are the future users? What is the impact of this product on the users, customers or manufacturers? These questions will be addressed through a composed video that will include the final product and the process of design/fabrication and will be part of its final exhibit. In addition to the video, students will have to design how the product will be displayed by designing and producing the package, graphics, and display platform. The studio will culminate in a public exhibition of the final products, video narrative and display design.
4.101 Tentative Schedule:

Week 1 (Feb. 5) Introduction
   2/5  Studio / Exercise Introduction
   2/7  Studio

Week 2 (Feb. 12) Research
   2/12 Studio
   2/14 Studio

Week 3 (Feb. 19) Concept Dev.
   2/19 No Class (Monday Schedule)
   2/21 Studio

Week 4 (Feb 26) Prototypes
   2/26 Studio
   2/28 Studio

Week 5 (March 5) Presentation
   3/5  CONCEPT PRESENTATION
   3/7  Studio

Week 6 (March 12) Prototype/Concept Development
   3/12 Studio
   3/14 Studio

Week 7 (March 19) Mockup & Design Development
   3/19 Studio
   3/21 Studio

Week 8 (March 26 Spring Break)
   3/26 No Class
   3/28 No Class

Week 9 (April 2) Mockup & Design Development
   4/2  Studio
   4/4  Studio

Week 10 (April 9) Mockup & Design Development
   4/9  Studio
   4/11 Studio

Week 11 (April 16) Display/Narrative Concepts
   4/16 No Class
   4/18 PRODUCTION PRESENTATION

Week 12 (April 23) Documentation
   4/23 Studio
   4/25 Studio

Week 13 (April 30) Finalize & Display of Object
   4/30 Studio
   5/2  Studio

Week 14 (May 7) Finalize Video & Presentation & Display of Object
   5/7  Studio
   5/9  Studio

Week 15 (May 14) (No New Assignments – Project Development)
   5/14 Studio
   5/16 Final Review
Learning Objectives:
The course consists of three exercises exploring various topics through concepts, drawing and physical fabrication. Students should be able to engage with an increasing level of design research through iterative studies and move fluidly between different modes and scales of operation. Conventions of design representation and communication through drawing and modeling will be explored. Students will need to demonstrate the application of design skills, understanding of conventions, and the ability to sustain an increasing level of research in the projects over the semester.

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. (01) Thesis: How clearly is the student articulating the conceptual intentions? (02) Translation of Thesis: How well is the student using their thesis to develop a design response to given problems? (03) Representation Appropriateness: How well matched is their choice of representational means to their intentions? (04) Representation Quality: How accomplished are they with drawing, modeling, digital representation, etc? To what degree do their representations convey what they ought to? (05) Oral Presentation Skills: How clearly are they presenting their ideas orally, whether at their desk, in class discussions, or to a more formal jury? (06) Participation in Discussions: How actively and how constructively are they involved in class discussions, both formally and informally? (07) Response to Criticism: How do they effectively take advantage of criticism from instructors, classmates and outside jurors? (08) Auto-Critical Skills: To what extent are they able to critique their own work regularly and effectively? (09) Attendance – see below.

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.

Studio Culture: Work in the studio will build sequentially. Therefore, your commitment to continual development is of paramount importance. 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 class 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.