Course Syllabus

**Class:** Course 16.682, also known as Momentum 2019
**Level:** Undergraduate (first years and sophomores)

**Credits:** 6 units

**Prerequisites:** None

**Lecturers:** Gregory Long, PhD (longg@mit.edu) office hours: F, 11am-1pm, in 35-316; Barbara Hughey, PhD (bhughey@mit.edu), and Marc Graham (mcor@mit.edu)

**TAs (office hours):** Office Hours (held in D-Lab) begin Friday, Jan. 11, and end Wednesday, Jan. 30.

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
<th>Office Hours</th>
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</thead>
<tbody>
<tr>
<td>Sarah Bricault</td>
<td>(<a href="mailto:sbricau1@mit.edu">sbricau1@mit.edu</a>)</td>
<td>(T, 3pm-6pm; W, 9am-12pm)</td>
</tr>
<tr>
<td>R'mani haulcy</td>
<td>(<a href="mailto:rhaulcy@mit.edu">rhaulcy@mit.edu</a>)</td>
<td>(W, 1pm-4pm; Th, 1:pm-4pm)</td>
</tr>
<tr>
<td>Jennifer Madiedo</td>
<td>(<a href="mailto:jmadiedo@mit.edu">jmadiedo@mit.edu</a>)</td>
<td>(M, 4pm-7pm; F, 4pm-7pm)</td>
</tr>
<tr>
<td>Tarfah Alrashed</td>
<td>(<a href="mailto:tarfah@mit.edu">tarfah@mit.edu</a>)</td>
<td>(M, 11am-2pm; T, 11am-2pm)</td>
</tr>
<tr>
<td>Michael Castillo</td>
<td>(<a href="mailto:mac0124@mit.edu">mac0124@mit.edu</a>)</td>
<td>(Th, 5pm-8pm; Sat, 2pm-5pm)</td>
</tr>
<tr>
<td>Julian Gomez</td>
<td>(<a href="mailto:jrgomez@mit.edu">jrgomez@mit.edu</a>)</td>
<td>(W, 5pm-8pm; Sun, 12pm-3pm)</td>
</tr>
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**Website:** [Course 16.682 in Stellar (IAP 2019)](https://stellar.mit.edu/t/courses/electrical/2019-spring/16_682/16_682_s19/index.html)

**Course description**

Momentum is a course offered to first and second year students during MIT’s Independent Activities Period (IAP). It is designed to prepare students for a future in the fields of science and engineering. This year, we are partnering with General Motors. In autonomous ride experiences of the future, design focus has shifted from driver to passenger. Join Momentum 2019 and General Motors’ innovation team to design a transformational entry and egress experience for passengers of autonomous vehicles. Through a combination of user-centered design and quick prototyping methodologies, you will learn what it takes to identify a problem worth solving before prototyping your solution on a real vehicle. Take the design process from start to finish and present your idea to innovation leaders at GM and other industry leaders.

**Goals**

- Apply basic concepts of deterministic design to frame and develop potential solutions to complex engineering challenges facing the world today.
- Employ an interdisciplinary approach to problem solving by ensuring technical feasibility and considering cultural and social compatibility, economic implications, and environmental impacts of the solutions that they generate.
- Develop teamwork, communication and professional skills.

**Course Structure**

- **Lectures** (3pm-5pm, all in 4-153)
  - 1/7/19: Introduction to Autonomous Vehicles
  - 1/8/19: Deterministic Design
  - 1/9/19: EE and Arduino Inputs
  - 1/10/19: MechE and Arduino Outputs
  - 1/11/19: Linkages and Prototyping

- **Workshops** (Students will be assigned to slots for the Mock Interviews and Public Speaking Workshop)
  - 1/4/19 in 4-163 from 1:30pm-3pm: CAPD Interviewing Workshop
  - 1/17/19 in 4-163 from 11am-1pm: Poster Presentation Workshop
  - 1/22/19 in 3-442 from 1:30pm-3pm: CAPD Mock Interviews (Group A)
  - 1/22/19 in 4-145 from 1pm-4pm: Public Speaking Workshop (Group B)
  - 1/23/19 in 3-442 from 1:30pm-3pm: CAPD Mock Interviews (Group B)
  - 1/23/19 in 4-145 from 1pm-4pm: Public Speaking Workshop (Group A)

- **Progress check-ins** (Each team will choose a timeslot)
  - 1/12/19 in D-Lab from 12pm-2pm: Office Hours with GM
• 1/15/19 in 4-144 from 3pm-7pm: Design Reviews
• 1/16/19 in D-Lab from 9am-12pm: Office Hours with GM
• 1/22/19 from 9am-12pm: Virtual Office Hours with GM
• 1/24/19 in 4-163 from 2:30pm-6:30pm: Progress Report
• 1/25/19 in D-Lab from 1pm-3pm: Office Hours with GM

• **Poster Presentation, Competition, and IACME Mixer**
  • 1/31/19 in Lobby 13: 10am-6:30pm: Poster Presentation/Competition and IACME Mixer

*Note: Mixer will be held in Samberg Conference Center, Dining Rooms 5+6

**Grading**

Grades will be assigned to each student based on participation and performance on the following:

<table>
<thead>
<tr>
<th></th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Lecture Attendance</td>
<td>25%</td>
</tr>
<tr>
<td>Poster Presentation and Competition</td>
<td>25%</td>
</tr>
<tr>
<td>Workshop Attendance</td>
<td>10%</td>
</tr>
<tr>
<td>Survey Completion*</td>
<td>10%</td>
</tr>
<tr>
<td>Peer Review^</td>
<td>10%</td>
</tr>
<tr>
<td>Design Review</td>
<td>10%</td>
</tr>
<tr>
<td>Progress Report</td>
<td>10%</td>
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*All participants complete a skills survey at the beginning of the course that will help the staff form teams and an exit survey at the end of the course to allow students to provide feedback.

^Peer Reviews will be completed anonymously and will provide a space to give feedback to all team members. Each student will complete a peer review for each of his/her team members; likewise, each student will receive a peer review from his/her team members. Participation in the feedback will count towards the student's overall grade.

**Resources**

- **Momentum Store** – Each team will get a $250 budget to purchase components needed for their project. Purchase requests will be made online using a [purchase form](http://libguides.mit.edu/momentum). Teams can start placing orders on Friday, January 11. The link for the purchase form can be found in the [Stellar website](http://libguides.mit.edu/momentum).
- **Communications Lab** - The MIT School of Engineering Communication Lab is a discipline-specific peer-coaching resource established to help students with their scientific writing, speaking, and visual design. Our trained graduate student and postdoc fellows offer individual coaching to help at all stages of the writing and design process - from brainstorming to final editing. Make an appointment with the EECS, ChemE, NSE, or BE Communication Labs to get individualized feedback on your projects!
- **Libraries** – For support in finding resources about virtual reality, education and other topics, please feel free to contact the librarians for this course: Courtney Crummett (crummett@mit.edu), Elizabeth Soergel (esoergel@mit.edu) and Phoebe Ayers (psayers@mit.edu). You can also find some books and databases for finding research articles at the library webpage for this course: [http://libguides.mit.edu/momentum](http://libguides.mit.edu/momentum)

**Contact information**

- For technical and lecture-related questions please contact Prof. Gregory Long (longg@mit.edu), Sarah Bricault (sbricau1@mit.edu), or any of the TAs for the course. For any other questions, please contact Devan Monroe (monroed@mit.edu) or come by the Office of Minority Education in 4-107.