MGT 6059 – Fall 2018
Analysis of Emerging Technologies
Monday / Wednesday 1:30 to 2:45
Scheller College of Business Room 221

Instructor:	Dr. Eric Overby
Office Hours:	I'm generally available; e-mail me and we'll set something up
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Emerging technologies can change the business and societal environment rapidly and dramatically. The ability to analyze emerging technologies and to forecast their implications for individuals, businesses, markets, and society is a critical skill in a broad range of contexts, including:

• Managers considering the use of an emerging technology within their organizations,
• Analysts predicting the impact of an emerging technology on an industry,
• Inventors or entrepreneurs developing a new technology,
• Policy makers charged with helping society benefit from emerging technologies.

This course introduces students to methods for analyzing and making decisions about emerging technologies. This includes tools, principles, and theories for evaluating which technologies will emerge and why. Given this understanding, students should be able to develop useful technology forecasts and leverage those forecasts for business advantage.

COURSE STRUCTURE
Most course sessions are two-pronged.
a) First, we will discuss an emerging technology, such as virtual assistants, energy storage, blockchain systems, drones, autonomous cars, DNA editing, etc. We will consider the implications of the technology for business and society. In this way, the course is a survey of emerging technologies.
b) Second, and perhaps more importantly, we will use each technology as a "case" to explore a deeper principle related to the emergence of new technologies. This will give us a framework for making predictions about which technologies will emerge and which will not, including what we can do about it and how we can profit from it as managers. We will discuss methods of scanning the horizon for emerging technologies (i.e., methods for forecasting) and the principles that govern whether a new technology is adopted or not (e.g., technology adoption theory, standards, network effects, legal / normative forces, stakeholder impact, etc.)

COURSE OBJECTIVES

General Course Objectives
After taking this course, students should be able to:
1) Use theory and principles to analyze how emerging technologies will affect individuals, firms, markets, policy, and society in the future.
2) Predict which technologies will be successful and why and develop forecasts and business scenarios to capitalize on those predictions.
3) Describe the current state and future prospects of emerging technologies such as those noted above.

Detailed Course Objectives

The following is a detailed list of objectives and learning points that we will cover during the course. Each exam question will refer back to one or more of the items in this list.

1) Describe, compare, and contrast forecasting methods, including the purpose of each method, how each method is conducted, what the output of each method is, and each method's strengths and weaknesses.
2) Describe and provide examples of the principles of (and "rules of") effective forecasting. Apply these principles to develop credible forecasts and be more critical of forecasts developed by others.
3) Develop a cone of uncertainty to depict a forecast / predictions in a visual manner.
4) Describe how to use business experiments to evaluate policies and develop forecasts. Apply the basic steps of experimental design to design and conduct your own business experiments.
5) Present and critique arguments for and against the prospect that artificial intelligence / robots will harm society by displacing work previously done by humans. Discuss and critique governmental programs and personal strategies for handling a future in which traditional work is largely conducted by robots.
6) Apply the 5 factors of innovation diffusion to analyze the potential diffusion of a new technology, including what factors stimulate diffusion, what factors do not, and why.
7) Describe the relationship between the S-curve of technology diffusion and the classification of adopter categories (i.e., innovators, early adopters, etc.) Discuss how/why the traditional adopter categories are being challenged.
8) Define and provide examples of a technology platform, a multi-sided platform, and the "sides" of a platform.
9) Describe the role of network effects in the success (or failure) of technology platforms, including defining, comparing, and contrasting cross-side and same-side network effects.
10) Apply theories and principles to predict which technology platforms will succeed, which will fail, and why. Apply strategies to increase the likelihood of success for platforms in which you have a stake.
11) Identify possible outcomes of platform competition, including factors that influence the likelihood of each outcome.
12) Discuss the pros and cons of joining a platform, including the potential benefits of reach, the potential consequences of holdup, and the potential benefits of establishing a single industry standard. Apply strategies for maximizing the benefits of a platform while mitigating the risks.
13) Apply the principles of network effects, platform competition, reach, and holdup to different contexts, including but not limited to smart speakers, contactless payments, digital music, and high-definition home video.
14) Describe, compare, and contrast different methods for establishing technology standards.
15) Discuss the current and historical role of technology standards in home entertainment, user authentication, and other technologies.
16) Discuss the pros and cons of technology standards from the perspectives of the developer of the standard and users of the standard.
17) Present and provide examples of possible strategies when a single standard is unlikely to emerge.
18) Compare and contrast a modular system to a monolithic system, including the advantages and disadvantages of modularity.
19) Describe the history, purpose, and tools of the Theory of Inventive Problem Solving (i.e., TRIZ) and apply them to solve technical problems.
20) Use stakeholder analysis tools to gauge which of several competing technologies enjoys the most advantageous stakeholder support.

21) Discuss the effect of stakeholders' influence on the emergence of new technologies such as the development of the electric vehicle in the 1990's and air travel and FM radio in the mid-20th century.
22) Describe the "chicken and egg" infrastructure problem for emerging technologies, along with classes of solutions.
23) Apply "chicken and egg" solutions to infrastructure problems in different contexts, including but not limited to new payment methods and alternatively-fueled vehicles.
24) Discuss how "new" and "old" technology ecosystems relate to each other, and apply this to forecast the emergence of a "new" technology.
25) Discuss issues with traditional gasoline vehicles, along with issues and opportunities associated with alternative fuel vehicles.
26) Discuss issues with fossil fuel-based methods of electricity production, along with issues and opportunities associated with "clean" alternatives.
27) Describe why fossil fuel combustion is linked to global warming and discuss regulatory and technological options for reducing emissions associated with fossil fuel use.
28) Describe and provide examples of how laws and regulatory policy can foster or hinder emerging technologies.
29) Discuss the inherent tension between innovation and regulation and provide examples related to the "sharing economy".
30) Determine whether an industry and/or company is vulnerable to "spontaneous deregulation" and if so, discuss and apply appropriate strategies.
31) Describe the infrastructure overprovisioning problem that characterizes electricity production and highway use.
32) Describe general solutions for solving the infrastructure overprovisioning problem and apply them in different contexts.
33) Describe and provide examples of how new technologies can reveal otherwise hidden information that may lead to potential discrimination and create adverse selection considerations.
34) Apply information revelation and adverse selection principles to analyze the potential impact of DNA testing and other technologies that reveal otherwise hidden information.
35) Discuss the role of social norms and ethics in the emergence of new technologies, including how technologies that are successful in certain cultures are frowned upon in other cultures.
36) Analyze the ethical considerations associated with an emerging technology by assessing the different components of the meaning of ethics.
37) Describe the current state and future prospects of emerging technologies such as airborne internet infrastructure, private space exploration, crypto-currencies and blockchain systems, contactless payments, robots and artificial intelligence, food engineering, smart speakers, human augmentation, biometric authentication, olfactory interface technologies, DNA sequencing and editing, alternative energy, alternative fuel vehicles, autonomous vehicles (including drones), and others.

GRADING
- Emerging Technology Briefing – 12%
- Report from the Future – 16%
- Presentation of Emerging Technology Briefing or Report from the Future – 5%
- Mid-Term Exam – 24%
- Final Exam – 24%
- Homework Assignments – 9%
- Class Attendance and Participation – 10%

Your final grade will be assigned as a letter grade according to the following scale:

A   90-100%
B   80-89.999%
C   70-79.999%
D   60-69.999%
F   0-59.999%

Emerging Technology Briefing

This is a group assignment. Each group will prepare a 3 to 4 page (single-spaced) briefing document on an emerging technology of their choice. Given the space limitations, choose a topic that is well-defined and narrow in scope. For example, do not choose "artificial intelligence" or "virtual reality"; instead, choose a specific application of these (very broad) technologies. Also, choose a topic for which the implications are not necessarily positive, because you will need to discuss the potential "dark side" in the briefing. Sources I recommend for potential topics include *Technology Review* and *Wired*. A 2-3 sentence statement of the emerging technology that you will analyze is due on or before **September 12**. In this, clearly state the emerging technology on which you will focus. The final briefing is due on **October 15**. **All** groups will prepare an Emerging Technology Briefing, and **half** of the groups will present the analysis contained within their briefings to the class. (Other groups will present the analysis contained within their Report from the Future; see below.) Students who want to present their briefing document will sign-up for a presentation date using Canvas. Please note that it is possible that your group will present your briefing document before or after October 15, even though the briefing itself is due on October 15. Additional detail about this assignment is provided in a separate document.

Report from the Future

This is a group assignment. You are to **pretend that the year is 2028** and that you are looking back on the preceding 30 years (i.e., 1998-2028). The project is to write a brief history (10 – 12 double-spaced pages) of a process that relates to one of the 17 Sustainable Development Goals set by the United Nations (see https://www.un.org/sustainabledevelopment/sustainable-development-goals/). By "process," I mean a set of steps to achieve some objective. For example, you might study the process of distributing clean water in sub-Saharan Africa: the objective is to provide clean water to users, and there are several steps involved in achieving this objective. You are to present this as a narrative of how the process evolved over time, providing specific examples of developments not only in the 1998-2018 period but also in the 2018-2028 period. Do NOT choose one of the 17 Sustainable Development Goals; instead, choose a narrower topic that relates to the one of the 17. For example, instead of analyzing "Good Health and Well-Being" (which is Goal #3), you might analyze the process of immunizing populations against malaria.

A one paragraph statement of the process that you will analyze is due on or before **October 24**. This paragraph should include the process on which you have chosen to focus and one key challenge related to the process. On **November 5**, you will make a 5-minute presentation to the class. This will describe the process that you are studying, at least one key challenge facing this process, and your ideas for how that challenge might be resolved (at least partially) by 2028. The report is due on **November 21**. **All** groups will complete the Report from the Future assignment, **all** groups will make the 5-minute presentation on November 5, and **half** of the groups will present their complete Reports from the Future to the class on November 26 and November 28. (The other half of the groups will present the analysis contained within their Emerging Technology Briefings; see above.) Students who want to present their Report from the Future will sign-up for a presentation date using Canvas. Additional detail about this assignment is provided in a separate document.

Information re: Groups and Grades for the Emerging Technology Briefing and Report from the Future
Group Composition
Groups should consist of **4** people.

- Each student will have one group ("first group") for the first part of the semester. This will be your group for completing the Emerging Technology Briefing. **Each student** will turn in his/her first group affiliation as a graded homework assignment on **August 29**. If your group signs up to present your Emerging Technology Briefing, then your group will belong to pool A. Otherwise, your group will belong to pool B.
- Each student will have a different group ("second group") for the second part of the semester. This will be your group for completing the Report from the Future. If your first group belonged to pool A, then you will form your second group from other students who were also in pool A. (Ditto for pool B.) *No more than 2 members of any first group may be in the same second group*. Each student will turn in his/her second group affiliation as a graded homework assignment on **October 15**.

Individual Student Grades for the Emerging Technology Briefing and Report from the Future
For the Emerging Technology Briefing and Report from the Future assignments, each group will receive a group grade. Each student's grade will be determined as follows: Student Grade = Group Grade + Student Adjustment Factor. The Student Adjustment Factor is based on peer evaluations and may be positive or negative. Additional detail about the Student Adjustment Factor is provided in a separate document. For each group assignment, each group member must submit peer evaluations. *No one from the group will receive credit for the assignment until all group members complete the peer evaluation.*

Presentation of the Emerging Technology Briefing or Report from the Future
Each group will present the analysis contained within either their Emerging Technology Briefing or Report from the Future to the class. The presentation should last 25 minutes, with 15-20 minutes devoted to the formal presentation and the remaining 5-10 minutes devoted to questions and answers. The structure of the presentation and the time allotted to each section should mirror the Emerging Technology Briefing or Report from the Future, whichever is applicable.

Georgia Tech Communication Center
For help with written, oral, and visual communication, consider making an appointment at the Communication Center, http://communicationcenter.gatech.edu. Appointments are free. The Communication Center's Rehearsal Rooms are also available for reservation, http://communicationcenter.gatech.edu/rehearsal-rooms-0.

Mid-Term Exam
The mid-term exam is closed book/closed notes and will cover the material up to the date the mid-term exam is administered. Questions on the mid-term exam will map to the detailed course objectives listed above. The format of the mid-term exam will be discussed prior to the exam.

Final Exam
The final exam is closed book/closed notes and will primarily cover material subsequent to the mid-term, although because the course material is cumulative, some of the materials from the pre mid-term portion of the course will be incorporated into the final exam. Questions on the final exam will map to the detailed course objectives listed above. The format of the final exam will mirror that of the mid-term exam.

Homework Assignments

Throughout the semester, we will have homework assignments. These assignments will have one or both of the following components:

- "Hands-on" exercises to familiarize you with some of the technologies we will explore.
- Questions that prompt you to comment on the issues raised by the readings. The purpose of these assignments is to guide you as you read the assigned articles so that you are prepared for class discussion.

Homework assignments are due at the beginning of the class session for which they are assigned. Late submissions will not be accepted.

Class Attendance and Participation

A substantial amount of the value of the course accrues during each session. Your experience and learning will suffer by missing class sessions, even if you are still able to do well on the exams (because the exams do not reflect the totality of the course experience). Given this, it is important to attend the class sessions and to participate in the classroom discussions. It is your responsibility to attend and prepare for each class session, read the assigned articles, and participate in the discussions.

In order to maximize your learning and achieve a good attendance and participation grade, you should:
1. Attend class. I will distribute a sign-in sheet for each session. If you wish to receive credit for attendance, you must sign the sign-in sheet.
2. Be on time. Being late / leaving early will negatively affect your participation grade. *Consistent absences, late arrivals, or early exits can result in a participation grade of 0.*
3. Prepare for class by completing the assigned readings, watching the assigned videos (if applicable), and completing the associated homework assignment (if applicable).
4. Engage with each other and participate in the discussion. Avoid walking in and out of the classroom during class; such behavior will negatively affect your participation grade.
5. Avoid behavior that signals lack of engagement with the class, such as excessive talking with other students, sleeping, etc.

The following illustrates how class participation grades will be assigned (out of 10 points.)
- *10 points*: The student attends class regularly and is well-prepared for each session. The student is a consistent contributor to class discussions, and his/her comments go beyond recitation of facts. The student expresses well thought-out opinions about substantive issues.
- *8-10 points*: The student attends class regularly and frequently participates, but there are times when the student's comments indicate that s/he has not thought deeply about the assigned readings and associated issues.
- *6-8 points*: The student attends class regularly and is engaged, but does not typically participate in the discussion.
- *2-5 points*: The student sometimes is absent, late to arrive, early to leave, or engages in behavior that signals lack of engagement, including walking in and out during class.
- *0-2 points*: The student frequently and/or consistently is absent, late to arrive, early to leave, or engages in behavior that signals lack of engagement, including walking in and out during class.

CLASS POLICIES AND RESOURES

Attendance, late arrivals, and early departures: Due to the nature of the class, attendance is very important. A poor attendance record will negatively affect your class participation grade. Given that the

class is taught in Technology Square, you must allow time to travel to and from class. It is not acceptable to be consistently late or leave consistently early because of travel; this may result in a participation grade of 0.

Exams: No make-up exams will be given. If you have to miss an exam because of unavoidable circumstances, let me know in advance, and we will work something out.

Academic integrity: Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. For information on Georgia Tech's Academic Honor Code, please visit http://www.policylibrary.gatech.edu/student-affairs/academic-honor-code. Any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Accommodations for individuals with disabilities: If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (often referred to as ADAPTS) at (404) 894-2563 or http://disabilityservices.gatech.edu/, as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Changes to the syllabus: The material within the syllabus is subject to minor changes due to circumstances throughout the semester. In particular, the availability of the guest speakers may cause the schedule to change somewhat. All changes will be announced and distributed in a timely fashion.

Use of electronic devices: All electronic devices (e.g., laptop, tablet, smartphone, etc.) are prohibited during class time unless being used in a class-based activity.

Campus Resources:
In your time at Georgia Tech, you may find yourself in need of support. Below you will find some resources to support you both as a student and as a person.

Academic support
- Center for Academic Success http://success.gatech.edu
    - 1-to-1 tutoring http://success.gatech.edu/1-1-tutoring
    - Peer-Led Undergraduate Study (PLUS) http://success.gatech.edu/tutoring/plus
    - Academic coaching http://success.gatech.edu/coaching
- Residence Life's Learning Assistance Program
    https://housing.gatech.edu/learning-assistance-program
    - Drop-in tutoring for many 1000 level courses
- OMED: Educational Services (http://omed.gatech.edu/programs/academic-support)
    - Group study sessions and tutoring programs
- Communication Center (http://www.communicationcenter.gatech.edu)
    - Individualized help with writing and multimedia projects
- Academic advisors for your major
    http://advising.gatech.edu/

Personal Support
Georgia Tech Resources

- The Office of the Dean of Students: http://studentlife.gatech.edu/content/services; **404-894-6367**; Smithgall Student Services Building 2nd floor
    - You also may request assistance at https://gatech-advocate.symplicity.com/care_report/index.php/pid383662?
- Counseling Center: http://counseling.gatech.edu; **404-894-2575**; Smithgall Student Services Building 2nd floor
    - Services include short-term individual counseling, group counseling, couples counseling, testing and assessment, referral services, and crisis intervention. Their website also includes links to state and national resources.
    - *Students in crisis may walk in during business hours (8am-5pm, Monday through Friday) or contact the counselor on call after hours at **404-894-2204**.*
- Students' Temporary Assistance and Resources (STAR): http://studentlife.gatech.edu/content/need-help
    - Can assist with interview clothing, food, and housing needs.
- Stamps Health Services: https://health.gatech.edu; **404-894-1420**
    - Primary care, pharmacy, women's health, psychiatry, immunization and allergy, health promotion, and nutrition
- OMED: Educational Services: http://www.omed.gatech.edu
- Women's Resource Center: http://www.womenscenter.gatech.edu; **404-385-0230**
- LGBTQIA Resource Center: http://lgbtqia.gatech.edu/; **404-385-2679**
- Veteran's Resource Center: http://veterans.gatech.edu/; **404-385-2067**
- Georgia Tech Police: **404-894-2500**

National Resources
- The National Suicide Prevention Lifeline provides free and confidential support 24/7 to those in suicidal or emotional distress at 1-800-273-8255
- The Trevor Project provides crisis intervention and suicide prevention support to members of the LGBTQ+ community and their friends. They are available 24/7 by telephone (1-866-488-7386), chat (http://www.thetrevorproject.org; 3-10pm Eastern, 7 days a week), and text (Text "Trevor" to 1-202-304-1200; available 3-10pm, M-F).

CLASS SCHEDULE

Date	Topic	Readings / Assignments
Aug. 20	Course introduction	Read the syllabus (required reading!)
Aug. 22	Examples of emerging technologies *Featured Technologies*: Aerial internet access infrastructure, Wearable computing, 3-D printing	Read: • Project Loon (Simonite, *Technology Review*, Mar/Apr 2015, pp. 40-45). https://www.technologyreview.com/s/534986/project-loon/ • What Your Phone Might Do for You Two Years From Now (Tedeschi, *New York Times*, Nov. 5, 2009). • Babel-Fish Earbuds (Metz, *Technology Review*, Mar/Apr 2018. p. 43). https://www.technologyreview.com/lists/technologies/2018/ • 3-D Metal Printing (Winick, *Technology Review*, Mar/Apr 2018. p. 43). https://www.technologyreview.com/lists/technologies/2018/
Aug. 27	Examples of emerging technologies, Forecasting pprinciples *Featured Technologies*: Space exploration	Read: • Reusable Rockets (Bergstein, *Technology Review*, Mar/Apr 2016, pp. 46-47). https://www.technologyreview.com/s/600767/10-breakthrough-technologies-2016-reusable-rockets/ • Six Rules for Effective Forecasting (Saffo, *Harvard Business Review*, July 2007, pp. 122-131). • OPTIONAL – The Case Against Google (Duhigg, *New York Times Magazine*, Feb. 20, 2018).
Aug. 29	Forecasting principles *Featured Technologies*: Audio recording, Deepfakes	Read: • What's Your Best Innovation Bet? (Schilling, *Harvard Business Review*, July/August 2017). • How Trump Won Re-election in 2020 (Stephens, *New York Times*, July 26, 2018). • How Trump Lost Re-election in 2020 (Leonhardt, *New York Times*, July 29, 2018). Turn-in: • Homework Assignment #1.
Sep. 3	No Class – Labor Day	
Sep. 5	Forecasting – Tools *Featured Technology:* Artificial intelligence, Prediction markets	Read: • The Seven Deadly Sins of AI Predictions (Brooks, *Technology Review*, Nov/Dec 2017). • Why We Need to Pick Up Alvin Toffler's Torch (Manjoo, *New York Times*, July 6, 2016). • OPTIONAL - Deciding How to Decide (Courtney, Lovallo, Clarke, *Harvard Business Review*, Nov. 2013, pp. 62-70). Turn-in: • Homework Assignment #2.
Sep. 10	Forecasting – Tools *Featured Technology:* Robots, Machine learning	Read: • The Wisdom of (Expert) Crowds (Duboff, *Harvard Business Review*, September 2007, p. 28). • The Discipline of Business Experimentation (Thomke and Manzi, *Harvard Business Review*, Dec. 2014, pp. 70-79).

Date	Topic	Readings / Assignments
Sep. 12	Artificial intelligence and the future of work *Featured Technology:* Chatbots, Drones	Read: • Microsoft also has an AI bot that makes phone calls to humans (Warren, *The Verge*, May 22, 2018). • The Relentless Pace of Automation (Rotman, *Technology Review*, Mar/Apr 2017). • Joshua Browder, Using Chatbots to Help People Avoid Legal Fees (Burrows, *Technology Review*, Sep/Oct 2017, p. 53). Turn-in: • Homework Assignment #3. • 2-3 sentence statement of the emerging technology that you will analyze for your Emerging Technology Briefing.
Sep. 17	Technology adoption and diffusion of innovations *Featured Technology:* Food technology, Olfactory interface technology.	Read: • The 'Impossible' Veggie Burger: A Tech Industry Answer to the Big Mac (Gelles, *New York Times*, Jan. 13, 2017). • New Synthetic Surface for Thoroughbreds Hits Pay Dirt (Finley, *New York Times*, Feb. 8, 2006). • This $150 Device Lets You Send Smells to Friends Through an iPhone — Like a Scented Text (Villas-Boas, *Tech Insider*, May 17, 2016). Listen to: • Podcast at http://www.npr.org/templates/story/story.php?storyId=6209658 Turn-in: • Homework Assignment #4.
Sep. 19	Technology platforms and network effects *Featured Technology:* Smart speakers and virtual assistants	Read: • Apple HomePod vs. Amazon Echo vs. Google Home: Which Smart Speaker Is Right For You? (*Forbes*, Feb. 9, 2018). • How to Launch Your Digital Platform (Edelman, *Harvard Business Review*, April 2015, pp. 90-97). • OPTIONAL: Network Effects Aren't Enough (Hagiu and Rothman, *Harvard Business Review*, April 2016, pp. 65-71.) Turn-in: • Homework Assignment #5.
Sep. 24	Guest speaker – Chris Green, Fish and Richardson	
Sep. 26	Technology platforms: Reach and holdup *Featured Technology:* Digital platforms, "Sharing" economy	Read: • Mastering the Intermediaries (Edelman, *Harvard Business Review*, June 2014, pp. 86-92). • Why Tesla Is Worth More Than GM (Surowiecki, *Technology Review*, July/August 2017). • Can Uber Live Up to Its $40 Billion Valuation? (Irwin, *New York Times*, June 13, 2014). • OPTIONAL: Challenge the Middlemen? (Dev and O'Connor, *Harvard Business Review*, Dec. 2015 pp. 119-123.)

Date	Topic	Readings / Assignments
Oct. 1	Standards and modularity *Featured Technology:* Biometric authentication, Modular phones	Read: • The Plot to Kill the Password (Brandon, *The Verge*, April 15, 2014). • Motorola's Modular Smartphone Dream Is Too Young To Die (Newman, *Fast Company*, April 5, 2018).
Oct. 3	Midterm Exam	
Oct. 8	NO CLASS – Fall Break	
Oct. 10	Infrastructure Featured Technology: Crypto-currencies (e.g., Bitcoin) and blockchain systems	Read: • What Is Bitcoin, and How Does It Work? (Popper, *New York Times*, Oct. 1, 2017). • Confused About Blockchains? Here's What You Need to Know (Popper, *New York Times*, June 27, 2018). • Websites That Pay Users With Blockchain Aim to Disrupt Facebook (Kharif, *Bloomberg*, Feb. 27, 2018). Turn-in: • Homework Assignment #6.
Oct. 15	Guest speaker - TBD	Turn-in: • Emerging Technology Briefing. • Homework Assignment #7.
Oct. 17	Infrastructure and stakeholder impact *Featured Technology:* Electric cars, Hydrogen cars	Watch: • Documentary: Who Killed the Electric Car. https://documentaryheaven.com/who-killed-the-electric-car/ Read: • What Needs to Happen Before Electric Cars Take Over the World (Ewing, *New York Times*, Dec. 18, 2017). Turn-in: • Homework Assignment #8.
Oct. 22	Infrastructure and stakeholder impact *Featured Technology:* Electric cars, Hydrogen cars	Read: • Right Tech, Wrong Time (Adner and Kapoor, *Harvard Business Review*, Nov. 2016). • The Fuel Cell Isn't Dead Yet (Condliffe, *Technology Review*, April 7, 2017).
Oct. 24	Futures in 1 hour	Read: • For Electric Cars Without a Plug, Thank Tesla (the Scientist) (Williams, *New York Times*, May 31, 2018). Turn-in: • One paragraph statement re: your Report from the Future. This paragraph should include the process on which you have chosen to focus and one key challenge related to the process.

Date	Topic	Readings / Assignments
Oct. 29	Stakeholder impact, legal, and regulatory *Featured Technology:* Autonomous vehicles	Read: • Managing our Hub Economy (Iansiti and Lakhani, *Harvard Business Review*, Sep/Oct 2017). • Waymo, a Google Spinoff, Ramps Up Its Driverless-Car Effort (Boudette, *New York Times*, March 27, 2018). • Robot, You Can Drive My Car (Biba, *Popular Mechanics*, Aug. 8, 2018).
Oct. 31	Sustainability, legal, and regulatory *Featured Technology:* Clean energy: solar, geothermal, fusion	Watch: • Top 10 Energy Sources of the Future (The Daily Conversation, https://youtu.be/uStFvcz9Or4). Read: • The Biggest, Strangest 'Batteries' (Cardwell and Roberts, *New York Times*, June 3, 2017). Complete: • Homework Assignment #9.
Nov. 5	Reports from the future 5-minute presentations	Present: • 5-minute presentation of Report from the Future, including the process that you are studying, at least one key challenge facing this process, and your ideas for how that challenge might be resolved (at least partially) by 2028.
Nov. 7	Sustainability, legal, and regulatory *Featured Technology:* Carbon capture and storage, geo-engineering	Read: • Earth: The Sequel The Race to Reinvent Energy and Stop Global Warming (Krupp and Horn, pp. 3-13.) • A Radical US Startup Has Successfully Fired Up its Zero-Emissions Fossil-Fuel Power Plant (Rathi, *Quartz*, May 31, 2018). Complete: • Homework Assignment #10.
Nov. 12	Legal and regulatory *Featured Technology:* Electric scooters	Read: • Introduction (Lessig, *Free Culture*, pp 1-7). • Spontaneous Deregulation (Edelman and Geradin, *Harvard Business Review*, Apr. 2016). • How I Learned to Stop Worrying and Love Electric Scooters (Roose, *New York Times*, June 6, 2018).
Nov. 14	Ethical and normative considerations *Featured Technology:* Human augmentation and DNA editing	Read: • Eugenics 2.0: We're at the Dawn of Choosing Embryos by Health, Height, and More (Regalado, *Technology Review*, Nov. 1, 2017). • How Science Can Build a Better You (Duncan, *New York Times*, Nov. 3, 2012.) Turn-in: • Homework Assignment #11
Nov. 19	Ethical and normative considerations *Featured Technology:* Personalized medicine	Read: • 23andMe Sells Data for Drug Search (Regalado, *Technology Review*, June 21, 2016). • New Gene Tests Pose a Threat to Insurers (Kolata, *New York Times*, May 12, 2017).

Date	Topic	Readings / Assignments
Nov. 21	No class – Thanksgiving	Turn-in: • Report from the Future
Nov. 26	Report from the Future presentations	
Nov. 28	Report from the Future presentations	
Dec. 3	Course wrap-up	
Dec. 13	Registrar exam slot between (2:40 PM to 5:30 PM)	Date/time are subject to change: Time and date are set by the Registrar's office