Technological Innovation Strategy

DRAFT SYLLABUS

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Office hours: By appointment – email instructor to set up time.

Required reading: Chapters from Schilling, M.A. 2022. Strategic Management of Technological Innovation, 7th edition. New York: McGraw-Hill Publishers (you can purchase book on Amazon or access pdf proofing copies of the chapters linked below)
Cases and articles (linked below)

The purpose of this course is to expose you to the dynamics of industries driven by technological innovation, and to train you to think strategically about technological innovation and new product development and deployment. In this course, we will tackle such questions as:

- Where does innovation come from? How can managers foster the generation and execution of innovative ideas?
- How and why are dominant standards chosen in "winner-take-all" industries? What are platform ecosystems and what determines a winning platform strategy?
- How do firms decide whether to "go it alone" or collaborate, and how do firms develop an effective collaboration strategy?
- What kind of protection methods are available for the firm's intellectual property? How do firms make the difficult choice between protecting their technologies with patents or copyrights, versus rapidly disseminating them?
- What are ways in which firms manage their new product development processes? What are the pros and cons for different kinds of innovations?
- How can firms deploy their innovations in a way that will maximize their chances for success?

Like the industries we will study, the course will be fast-paced, and every effort will be made to make the class both challenging and exciting. Because of the fast-paced nature of the course, it is vitally important that you come to class prepared and ready to discuss the topics. If you stay up on the material you will learn more during the discussions and be successful at the assignments.

GRADE BREAKDOWN
Preparation and Participation:

Video Responses	30
Class Discussion and in-class exercises	30
Group project	40
Total	**100**

Video Responses: Each class has (an) assigned video(s) with a brief engagement exercise. Please complete the deliverable for the exercise and submit your response via Google Forms by **5 pm the day before the class**. Some of these submissions will be chosen for discussion in the class.

Class discussion & in-class exercises: We will use a variety of in-class exercises to give you opportunities to apply and deepen your knowledge of the course content. Some of these will be turned in for participation points. I may also adjust your total for this grade based on the quality of your voluntary participation in class.

Group project: In groups of 4-6 students, please analyze a recent innovation (may have been commercialized within the last 3 years or may be still pre-commercialization) and apply the concepts from at least four of the chapters we used in class (your choice which chapters), concluding with specific and actionable recommendations. Not every concept from every chapter will be applicable – choose carefully the concepts that you can apply in a meaningful way. The projects will be graded with respect to the substantiveness of the application of the concepts, and the rigor and insight demonstrated in the recommendations. For this project, please submit a slide deck (no more than 12 slides) and a video presentation (<12 minutes). For the video presentation, please upload your video to Youtube and submit the link (it may be unlisted or public). Submit both the slide deck and link to mas28@stern.nyu.edu within five days of our last day of class, by 9pm EST. These videos links will be distributed to other students to review and students should watch the videos within 48 hours and provide sensitive and professional feedback for each video (excluding their own team) using the feedback form that will be provided. Providing feedback to your peers will contribute to your "In-class exercises and discussions" grade.

SCHEDULE

Class	Topics and Readings
1	**Introduction & Sources of Innovation** **Read Text**, Chapter 2 https://tinyurl.com/Schillingch2 **Video Response:** Please watch this video on "Individual Creativity as a Source of Innovation": https://youtu.be/j3jKzYnzC6c Then, identify an example of an innovator that is not mentioned in the video that that you think exhibits at least two of the characteristics described in the video. Please provide some evidence (e.g., a quote, something written about them in an article, etc.) of the characteristics. Please submit your responses via this Google form https://docs.google.com/forms/d/e/1FAIpQLSesDCyB5mzHGAF8I-

	kC46SHCzymQD9fEvkWiDkpQgUYa5qjWg/viewform?usp=sharing by 5pm the day before class. **Prepare for Discussion**: **SpaceX 2022 case** https://tinyurl.com/SpaceXcase 1. What was Musk's goal in creating SpaceX? 2. What capabilities and personality traits have enabled Elon Musk to be innovative? 3. How would you characterize the space industry? What does SpaceX do differently from the incumbents in the space industry and why? 4. Do you think the space industry incumbents will change their methods of producing space vehicles in response to SpaceX's entry? Why or why not? Bonus point (not in case): How is Jeff Bezos' company Blue Origin similar to or different from SpaceX? What are each company's advantages and disadvantages?
2	**Standards Battles, Dominant Designs and Platforms** **Read Text**, Chapters 4 https://tinyurl.com/Schillingch4 **Video Response**: Please watch the two short videos below: Short video on network externalities: https://youtu.be/6XxbNfh5ny0 Short video on platform ecosystems: https://youtu.be/yAFSRq-NYTY Then, identify an example of a platform ecosystem NOT described in either of the videos and explain why it does or does not have a) same side network externalities, and b) cross-side network externalities. Please submit your responses via this Google form https://docs.google.com/forms/d/e/1FAIpQLSfpj2TOLaXUmULIXkf-VtUIpte4TxwabVpK2wOyRUKnfpX5Zw/viewform?usp=sharing by 5pm the day before class. **Prepare for Discussion**: **Live case on Netflix versus Disney/Hulu:** Search on the internet for data and articles to answer the following questions about the streaming industry that we will use for an **in-class exercise on platform competition**: 1. How many subscribers does Netflix have? How many subscribers does Disney/Hulu have? 2. How many movies & TV shows are available on each service? Are there any key differences between the shows available on each service? 3. What are the subscription terms and download fees for each service? Then, from your own opinion, answer the following questions: 1. Do the platforms have any differences in standalone utility (searchability, ease of use, graphics quality, recommenders, etc.)? 2. What are each streaming system's advantages in its ecosystem of complements (i.e., new releases, highly popular shows, etc.)? How much (approximately) content is exclusive to each service versus on both? Do they have different strategies with respect to content (e.g., do they selectively promote content? If so, how?)

	3. How do the streaming systems make money from their platform and ecosystem? (i.e., what is the business model and who pays?) 4. Do the services appeal to different market segments? (If so, how and why?) Do many people subscribe to both?
3	**Collaboration Strategies** **Text**, Chapter 8 (no need to read the short case on Zeta in the chapter as we will be using a more complete version below) https://tinyurl.com/Schillingch8 **Video Response**: Please watch the two short videos on "Forms of Collaboration" and "Choosing and managing collaboration partners" below: Short animated video on different forms of collaboration**:** https://youtu.be/tJlJJhPJHs0 Short animated video on choosing and managing collaboration partners**:** https://youtu.be/EHULUlCYOUQ Then identify two different examples of real-world collaborations (for the purpose of innovation) initiated within the last two years that exhibit different collaboration forms. Please submit your responses via this Google form https://forms.gle/hDmFYYEQWkab26Pt9 by 5pm the day before class. **Prepare for Discussion**: **Zeta Energy 2022 https://tinyurl.com/ZetaEnergy** Read the Zeta Energy case and then search on the internet for data and articles to answer the following questions: 1. Who are the major lithium-ion battery producers in the world? Would you characterize the industry as concentrated? 2. What are the major industries that currently use lithium-ion batteries? What are the major industries that would potentially use rechargeable batteries if they were lower cost and/or lasted longer? 3. Some of the key dimensions along which batteries compete are $/kWh (cost), gravimetric density (how much a battery of a given energy capacity weighs), volumetric density (how much space a battery of a given capacity takes up), safety (i.e., likelihood catching fire, etc.), power (how fast energy can be discharged for tasks like powering a heavy truck up a hill) and cycles (how many times the battery can be discharged and recharged before it has lost 80% of its capacity). Rank how important you think each of these dimensions are for 5 of the major industries you identified in #2 above. 4. Considering your analysis above, what kind of collaboration strategies would you recommend for Zeta Energy? Who are potential partners you would recommend, and why? **In-Class Exercise:** You will be put in teams to prepare a collaboration strategy recommendation for Zeta Energy that you will pitch to the class.

4	**Protecting Innovation** **Read Text**, Chapter 9 https://tinyurl.com/Schillingch9 Video Response: Please watch the short video below on "Intellectual Property Protection" https://youtu.be/d6F4Hma6ijg Then identify examples of real products (not from the video) protected by a) patent, b) copyright, c) trademark, and d) trade secret. It is possible to have a product that is protected by multiple methods (e.g, trademark and patent). Please submit your responses via this Google form https://forms.gle/vwbJQwXV4UuYa9wJ7 by 5pm the day before class. Harroch, R. 2017. "10 Intellectual Property Strategies for Startups," Forbes, June 6th. (https://www.forbes.com/sites/allbusiness/2017/06/06/10-intellectual-property-strategies-for-technology-startups/#16c72728ab1b) **In-Class Exercise: Intellectual Property Strategy Quiz Show!**
5	**New Product Development Processes** **Read text**, Chapter 11 https://tinyurl.com/2thajc78 **Prepare for Discussion**: Moderna Case https://hbsp.harvard.edu/import/1323552 1. Is AI an existential threat to Big Pharma? 2. Using the frameworks used in the class (S-Curves, disruptive innovation, modularity, platform ecosystems, etc), how would you describe Moderna and the industry it is in? 3. What enabled Moderna to move so fast with their COVID-19 vaccine? 4. How would you describe Moderna's new product development process? How does it contrast with that of traditional pharmaceutical and biotechnology firms? 5. What are the most important priorities for Moderna going forward?
6	**Crafting a Deployment Strategy** **Read Text**, Chapter 13 https://tinyurl.com/Schillingch13 Video Response: Please watch the short video on innovation deployment: https://youtu.be/X3jMEkXPmz8 Then for a new product launched within the last five years, take two of the five launch strategy categories from the video (Timing, Pricing, Licensing and Compatibility, Distribution, Marketing) and describe the strategy used for each of those categories for the new product. Please submit your responses via this Google form https://forms.gle/Y1nM8f6WbpT6jKz58 by 5pm the day before class. **Prepare for Discussion**: Upside Foods 2025 https://tinyurl.com/4hvf988z 1. Why did Uma Valetti found Upside Foods (originally Memphis Meats)? 2. What are the barriers to consumer adoption of cultivated meat?

	3. What are the economic and social factors that could facilitate adoption of cultivated meats? 4. What methods has Upside used to deploy its product? What are the pros and cons of those methods? 5. What recommendations would provide to Uma?

This schedule is a guideline only; the instructor reserves the right to change the schedule as necessary.

CLASSROOM POLICIES
We will use the Stern default classroom policies:

Late Submission of Assignments: Late assignments will either not be accepted or will incur a grade penalty unless due to documented serious illness or family emergency. Instructors will make exceptions to this policy for reasons of religious observance or civic obligation, only when the assignment cannot reasonably be completed prior to the due date and the student makes arrangements for late submission with the instructor in advance.

General Behavior: Students will conduct themselves with respect and professionalism toward faculty, students, and others present in class and will follow the rules laid down by the instructor for classroom behavior. Students who fail to do so may be asked to leave the classroom. (Honor Code and Stern policy)

Collaboration on Graded Assignments: Students may not work together on individually graded assignments unless the instructor gives express permission. (Honor Code)

Use of AI. You can use AI to clean up your writing or generate ideas for your group project, but your analysis and application of the concepts must be 100% your own. If you use AI for the analysis in your projects, it is very likely to make big mistakes or incorporate irrelevant (or hallucinated) material, leading to a very poor grade. Where you do use AI, please acknowledge it precisely. There should be no instance where work done by AI could be misinterpreted as work done by you.