COURSE DESCRIPTION
The course is designed to meet the needs of future managers, entrepreneurs, consultants, and investors who must analyze and develop business strategies in technology-based industries and are seeking to understand how firms navigate technological change. Firms often compete through technological innovations and face significant uncertainty with respect to emerging technologies and business models. For example, in recent years, the emergence of cutting-edge AI technologies has had implications for competition and strategic decision-making both for the firms developing such tools as well as others impacted by them. The emphasis in the course is on learning conceptual models and frameworks to help navigate the complexity and dynamism in creating and capturing value with technology. This is not a course in new product development or in using information technology to improve internal business processes. The course will take a perspective of both established and emerging firms competing through technological innovations and focus on the key strategic drivers of value creation and appropriation in the context of business ecosystems.

Some overarching questions that the course will help answer are:

- Why do many promising technological innovations fail to create value, and what can firms do to manage the challenges of commercializing technological innovations?
- What are the different types of business models that firms can use to appropriate value from their technological innovations, and how should firms choose which business model to use?
- Why do firms struggle to compete in a changing technology landscape, and what can they do to increase the odds of success?
- How can technology start-ups disrupt incumbent firms?
- How might firms strategic considerations change in response to novel technological innovations around them?
- How to create value in a platform-based ecosystem, and manage the shift from a product-based to a platform-based technology strategy?

The course uses a combination of interactive lectures, case analyses and simulations. It draws on the rich and emerging stream of research in technology management and strategy that moves beyond “one size fits all” approach to technology firms and instead focuses on the choices that managers and entrepreneurs face in a specific strategic situation. Cases and simulations will offer an opportunity to integrate and apply the theories and frameworks in a practical way and are drawn from a diverse range of technology-based industries and emerging technology trends. We will frequently integrate current events and new technology trends in class exercises to apply course concepts (e.g., go-to-market strategy for an AI-oriented start-up, ecosystem development for clean energy technologies). Class discussions are
mainly based on strategic (not technical) issues. Hence, a technical background is not required for fruitful participation. In addition, guest speakers will be invited to share their perspectives on specific and contemporary issues related to the course.

EVALUATION

Individual

Participation
- Attendance (12.5 points)
- In-class contribution (22.5 points)
- Pre-class poll assignments (10 points) due at 12pm on the day of class.
- Case write-up (10 points) due the day before the scheduled class for that case.
- Back Bay Battery write-up (10 points) due on 10/1 at 12pm.

Group

Technology strategy analysis project
- Initial project summary due (5 points) on 10/31 at 11:59pm
- Final group project and report (30 points) due on 11/19 at 9am

As a matter of principle, I will not be accepting late assignments unless in the case of personal health or personal emergencies.

PARTICIPATION

This is designed to be an interactive discussion-based course. Hence, participation is a crucial component of not only the evaluation but more importantly the learning in the course. It is expected that you are well-prepared for each class session. To help you prepare, discussion questions and online polls related to the specific topics and cases will be provided in advance on the course website. You are expected to arrive at class having already done the case readings. Other readings are considered supplemental – you can use them as material to prepare for class or you can use them as companion material following each lecture.

Everyone will be individually responsible for responding to the poll. Answering the poll will not take much time beyond normal preparation for the class. The pre-class poll questions are meant to stimulate thinking around the topics of conversation for that day. I may call upon you to discuss your answer in the poll. Please note that the pre-class polls are due at 12pm on the day of class, and I will not accept late submissions.

In general, three factors determine high quality contribution in the class. First, is a given comment clearly related to the case and/or topic being discussed? Second, does the comment help move the class discussion forward? Third, does the comment draw on specific facts from the case or readings or personal experience to support the assertion? In addition to case or class discussions, in class contributions can also be made by asking thoughtful questions and/or bringing relevant topics or current events to class to discuss. Note that quality, not quantity, will determine the effectiveness of your comments.

For case discussion, it is helpful to identify the key choices facing the protagonists, to evaluate alternatives (including what additional information you might need to gather to make a clear decision), and to think about the course of action you would recommend and why.

Of course, the underlying condition for class participation is attendance. I will be taking attendance. Arriving late is treated as a distinct event from being present at the start of class. Unexcused absences and tardiness will adversely affect class participation marks. Please note that slides will be posted after
each class on Canvas.

**USE OF ELECTRONICS AND TECHNOLOGY**

Research has shown that such use of electronic devices significantly disrupts learning, both for the students using the device and for others in the class. Phones must be turned off and put away, except in the case of personal emergency. **The use of laptops and tablets for note taking and referring to the case is not allowed** unless for running simulations in class on designated days. Students not complying with these policies will lose participation points.

Recent advances in generative AI technologies have provided students with a number of new tools (e.g., ChatGPT) that they may be able to utilize when completing assignments. Students are permitted to use such tools to help complete class assignments. If you are using any such tools, I ask that you please disclose how you used the tool as part of your submission. This will not factor into grading or evaluation but will be useful for me as I consider how to craft assignments moving forward.

**CASE WRITE-UP**

To help you develop a richer perspective on the cases, you will work on an individual assignment of answering the study questions associated with one of the cases that we discuss in the class. The study questions are available on Canvas under the specific class session. You will also be the class “leader” for that case discussion. This provides an opportunity for each student to “stand out.” A sign-up sheet to choose the case will be provided on the first day of class. The case write-up should be a maximum of 1,200 words of text. Additionally, you may attach 1 or 2 exhibits based on your analysis if they directly support your arguments/recommendations. The write-up is due by the evening prior to the day the case is discussed in class. Strong write-ups will develop logical arguments using course concepts/frameworks and the relevant information (quantitative/qualitative) from the case.

**BACK BAY BATTERY SIMULATION WRITE-UP**

Firms face many challenges and tradeoffs with respect to their technology investment decisions. The case of Back Bay Battery will help us engage deeply with such challenges and tradeoffs in a real business situation.

You will play the role of the President at Back Bay Battery Company, a manufacturer of nickel metal hydride (NiMH) batteries. The President’s responsibility is to determine the appropriate timing and level of R&D investments between existing and new battery technologies under uncertain real-world conditions. Your decisions are of course subject to corporate-level financial constraints. You are required to play a single run of the simulation and submit the individual write-up. You will play another slightly modified run in groups in class. Note that each run includes making decisions over an eight-year period. The write-up is meant to capture your thinking over the course of the simulation. It should be a maximum of 1,200 words of text and an optional 1 page of exhibits.

The write-up should address the following questions (either in a Q&A form or an essay form):

- What was the initial strategy and the logic underlying that strategy? Please be explicit about the assumptions that formed the basis for the initial strategy.
- How did the strategy change over time (i.e., between the first and the eighth year), and what were the reasons for those changes?
- What were the main challenges that you faced while making decisions?
- What additional information you would have liked to have before making decisions? Please be explicit about how might that information be collected and how would it improve decision-making.
- What did you take away from the simulation?
TECHNOLOGY STRATEGY ANALYSIS PROJECT

We will draw on each other to explore the frontier of technology strategy by engaging deeply with current and emerging episodes of firms competing through their technological innovations. For this project, you will work in a group of 5 or 6 students. As part of the project, you will provide an in-depth presentation on a firm that you believe is facing an interesting or challenging strategic landscape with regards to creating and capturing value from technology. You may not select a company that we have discussed in any of the case discussions during the course of the semester, and you may not select a company that has already been selected by another group.

The focus of the project is providing a strategic recommendation to the firm you select. In a ten-minute presentation, you should:

- Provide a brief summary of the company and its current strategic positioning.
- Identify and clearly communicate the key challenge that the firm faces moving forward or a key decision that they must make.
- Provide a strategic recommendation to the firm based on this challenge or decision.

The project should be well-researched, based on an extensive review of publicly-available information as well as specialized databases available through Penn Libraries. I encourage you to attempt to gain access to the firms being studied to collect data and conduct interviews, since this can lead to a uniquely rich and insightful analysis. Presentations should be forward-looking and provide clear and actionable strategic guidance to the studied firm.

Each group will first provide a 1-2 page proposal and an optional 1 page of exhibits that would be evaluated for fit and provided with initial feedback. The proposal should include the following information:

- Project motivation.
- Brief synopsis of focal firm.
- Brief synopsis of the key challenge they are facing.

The analysis should be completed in the form of a slide deck with a maximum of 12 slides (excluding the title slide) and can include presentation notes for sharing additional details underlying the analysis.

As a general note, a litmus test for a strong analysis is a clear articulation and logic for the choices being made by the focal firm, the assumptions under which those choices make sense, and the root cause (the why of why!) of why they will (not) work. Of course, all of this should be backed by data (quantitative and/or qualitative) and guided by the concepts and frameworks covered in the course.

Each group will have an opportunity to update the analysis based on the feedback received from the peer group and present their analysis to the class.

GRADING SCHEMA FOR WRITE-UPS AND ANALYSIS

Because course deliverables (write-ups, analysis) are designed for the purpose of both facilitating and evaluating your learning and are not based on quantitative problem-solving, they will be evaluated through a simplified schema -- "check," "check plus" and "check minus." In general, you should interpret these as the following:

- Check ~ 80-85% points (you have answered all questions and/or addressed the key issues, and demonstrated a good understanding of the course concepts and frameworks)
- Check plus ~ 95-100% points (you have answered all questions and/or addressed the key issues, and have used the concepts and frameworks in the course in a precise and careful manner to generate outstanding theoretical/practical insights)
- Check minus ~ 65-70% points (you have not yet fully demonstrated that you understand the frameworks and concepts from the course and how they are applied, and/or your write-up does not address all of the questions or key issues)

Please note that evaluations in the class must meet a strict curve, so students are evaluated relatively. There are no opportunities for extra credit. If you are particularly concerned about your grade, please reach out to me early in the semester to clarify any expectations regarding grading and evaluation rather than after assignments have been graded.

**NOTE ON CITATIONS**
Material reproduced verbatim should be enclosed in quotation marks, with proper attribution made to the source. Ideas and concepts even if not quoted verbatim should be attributed to the author/source, also via proper citation.

**FEEDBACK**
I would like to help in every way that I can to enhance your learning experience, and I am also always looking for ways to improve the course. Hence, I strongly encourage anyone with specific or general questions/suggestions regarding the course structure, content or discussions to reach out to me.
## Course Outline

Sessions denoted with a * indicate case discussions with case assignment sign-ups available. Details on all guest speakers will be shared in class.

<table>
<thead>
<tr>
<th>Date</th>
<th>Session</th>
<th>Topic</th>
<th>Readings and Assignments</th>
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<tr>
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<td>Course introduction and logistics</td>
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<tr>
<td>9/5/2024</td>
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<td>E-Ink (guest speaker)*</td>
<td>E Ink (HBS 9-705-506)</td>
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<td>Abgenix*</td>
<td>Abgenix and the XenoMouse (HBS 9-501-061)</td>
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<td>Tesla*</td>
<td>Tesla: Fueling the Electric Car Revolution (Wharton Case Study)</td>
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<td>9/26/2024</td>
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<td>Microsoft*</td>
<td>Microsoft (Wharton Case Study)</td>
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<td>Back Bay Battery Simulation</td>
<td>Simulation: Back Bay Battery (HBS 7015-HTM-ENG)</td>
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<td>NO CLASS: FALL BREAK</td>
<td><strong>Back Bay Battery Write-Up due at 12pm ET.</strong></td>
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<td>Kodak*</td>
<td>Kodak’s Digital Transformation Journey (Wharton Case Study)</td>
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| 10/22/2024 | 16    | Self-Disruption: Netflix & Metaverse                  | (1) Netflix (HBS 9-615-007)  
(2) Metaverse Wars (HBS 72341-PDF-ENG)                                                                                                   |
| 10/24/2024 | 17    | Adobe*                                                 | Reinventing Adobe (HBS 514066-PDF-ENG)                                                                                                  |
| 10/31/2024 | 19    | Apple and Google*                                      | Apple, Google and the Smartphone Revolution (Wharton Case Study)  
Project proposals due at 11:59pm ET.                                                                                                          |
| 11/5/2024  |       | NO CLASS: ELECTION DAY                                |                                                                                                                                         |
Harvard Business Review.                                                                                                                     |
| 11/12/2024 | 21    | Investing in Technologies in B2B SaaS (e.g., AI, blockchain) (guest speaker) |                                                                                                                                         |
| 11/14/2024 | 22    | Spotify (guest speaker)                                | (1) "How Spotify Came to be Worth Billions." (2018) BBC.  
(2) Spotify (HBS 9-516-046).  
| 11/19/2024 | 23    | Presentations I                                        | Final project presentations due at 9am ET.                                                                                               |
| 11/21/2024 | 24    | Presentations II                                       |                                                                                                                                         |
| 11/26/2024 |       | NO CLASS: THANKSGIVING                                |                                                                                                                                         |
| 12/3/2024  | 25    | Presentations III                                      |                                                                                                                                         |