

The Wharton School, University of Pennsylvania
Operations, Information and Decisions Department

OIDD 314: Enabling Technologies

Professor: Lynn Wu
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Office Hours: Tuesday 4:00pm-5:00pm, JMHH 572 (or by appointment)

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Lectures Sec 001, Monday and Wednesday: 10:15am-11:45am, JMHH F80
Sec 002, Monday and Wednesday: 3:30pm-5:00pm, JMHH F80

Format:

The class will be taught primarily in person. There will be a few virtual asynchronous classes during the semester.

Mask:

Wearing a mask in class is highly encouraged but optional. However, this policy is subject to change.

Course Description

Conducting business in a networked economy invariably involves interplay with technology. The purpose of this course is to improve understanding of technology (what it can or cannot enable), the business drivers of technology-related decisions in firms, and to stimulate thoughts on new applications for commerce (including disruptive technologies). The Fall semester class provides a comprehensive overview of various emerging technology enablers with a focus on big data analytics and technologies that rely on big data. No prior technical background is assumed and hence every effort is made to build most of the lectures from the basics. However, the Fall semester class will assume basic understanding of statistics and will focus more on big data analytics. Some assignments in the fall will involve data analytics using Python or R.

We will use lectures, class discussion, guest speakers, exercises and team projects to examine a variety of technologies that rely on big data including artificial intelligence/machine learning, Google trends, cloud computing, AR/VR, online advertising, social media, people analytics and a variety of other topics. Fundamental economic principles will be illustrated using business case studies. We will choose a

specific sector of the tech industry and investigate the technology enablers, the major players in the sector, competitive dynamics and future opportunities in the sector.

Course Goals

1. To learn how to respond to new technologies as they arise
2. To understand the business value of artificial intelligence and business analytics
3. To understand the principles of online advertising
4. To learn how to leverage emerging media to better communicate with stakeholders

Electronic Device Policy

To encourage learning, electronic devices (e.g., mobile devices, tablets, laptops) during lectures are not allowed unless explicitly directed by the instructor. Electronic devices may be used during the time in which you are working on in-class exercises.

If you must keep a phone on by reason of a personal emergency, you must inform me before class begins.

Tentative Schedule of Sessions

| DATE | | SESSION | Due Dates |
|-----------|----|---|---|
| Mon 8/29 | 1 | Async Preclass— Introduction, watch video before 8/31 | |
| Wed 8/31 | 2 | Economic Models I: self-driving cars | |
| Wed 9/7 | 3 | Economic Models II: online dating | |
| Mon 9/12 | 4 | Data: Competing in Analytics | |
| Wed 9/14 | 5 | Data: Regulation | |
| Mon 9/19 | 6 | Google Trends: Housing sales, Race, Gender, Social Trends | |
| Wed 9/21 | 7 | Data Analytics Overview | |
| Mon 9/26 | 8 | Analytics Dojo--optional | In Class Quiz |
| Wed 9/28 | 9 | Cloud/Edge/IoT | |
| Mon 10/3 | 10 | Deep Learning—Tech Primer | Small Project #1 (Due at 11:59pm) |
| Wed 10/5 | 11 | GPT3, foundational models | Group & Topic (Due at 11:59pm) |
| Mon 10/10 | 12 | Robot Automation | |
| Wed 10/12 | 13 | Groups Meetings with Professor | |
| Mon 10/17 | 14 | NO CLASS/work on project | |
| Wed 10/19 | 15 | Groups Meetings with Professor | |
| Mon 10/24 | 16 | AI and Labor | |

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|-----------|----|------------------------------|--|
| Wed 10/26 | 17 | AI and Business Redesign | |
| Mon 10/31 | 18 | AI and Innovation | In Class Quiz |
| Wed 11/2 | 19 | Algorithmic Fairness & Risks | |
| Mon 11/7 | 20 | Search Advertising | Small Project #2 (Due at 11:59pm) |
| Wed 11/9 | 21 | Internet Advertising | |
| Mon 11/14 | 22 | Social Media Analytics | |
| Wed 11/16 | 23 | AR/VR | Small Project #3 (Due at 11:59pm) |
| Mon 11/21 | 24 | Exam Review—optional | |
| Mon 11/28 | 25 | Exam | In-class exam |
| Wed 11/30 | 26 | Final Project Presentation | |
| Mon 12/05 | 27 | Final Project Presentation | |
| Wed 12/07 | 28 | Final Project Presentation | Group Evaluation & Project write-up (Due 12/15 at 11:59pm) |

Please check the class website before every class for announcements, assignments and schedule changes.

Intended Audience and Prerequisites

Anyone interested in understanding the various technologies fundamental to business in a networked world. No prerequisite or technical background is assumed, although basic statistics is helpful. Some assignments will require programming but instruction will be provided so you only need to modify the code. Class lectures are built from the basics and are self-contained. Students with a limited technical background will find the course a useful primer on technology from a managerial perspective. Students with moderate to advanced technical backgrounds may find the course a useful survey of emerging technologies. The course is highly recommended for students with interest in any of the following areas: consulting/strategy, and product management/business development, entrepreneurship and venture capital in the tech sector. The Fall semester will focus more on **big data analytics**.

Requirements and Grading

There are 5 parts that contribute to the final grade in the course. Some of these are based on group work.

- 1) Exam (20%)
 - The final exam is based on the complete contents of the course: analytical tools, lectures, in-class case discussions, etc. However more emphasis will be on materials not covered in in-class quizzes.
 - The final exam is an open book - open notes exam with some quantitative and qualitative questions.

- The administration (and your instructor) is very strict about ensuring that all students take the exam on the assigned date. Please mark your calendars!
- 2) Two equally weighted in class quizzes (10%)
 - In-class quizzes are mostly multiple-choice questions designed to be finished in 20 minutes. They will cover materials based on contents prior to the quiz date.
 - 3) Small Projects 20%
 - There will be 2-3 individual projects (evenly distributed and add up to 20% of your grades). Two projects require data analytics.
 - Assignments are due by 11:59pm ET on the due date. Late assignments are not accepted, i.e., late assignments will receive zero credit. Unfortunately, I cannot help you make up missed project through other assignments/readings. It is not easy to create new assignments for individual students. Please do not email the professor or TA regarding this.
 - Assignments are submitted electronically through Canvas.
 - Be aware that Canvas is a bit creepy – it tracks every log in and click from any device.
 - 4) Class participation 15%
 - You receive 1 point for each session that you “show up” to, i.e., you are ready to participate at the start of class (literally in your seat at the start) and you remain engaged throughout the entire session (i.e., you do not use electronic devices, etc.).
 - a. For fairness to all students, I will only excuse absences for which I receive an email from the Undergraduate Program Office.
 - Additional points will be rewarded for substantive contributions to classroom discussion.
 - b. To improve participation opportunities, I will call on students. Therefore, class preparation is necessary to do well in this class.
 - Two lowest session grades will be dropped.
 - 5) Project (Group) 35%
 - A group of 5 students will work on a class project. The scope of the project can vary from being a data analytics project, a business plan, a survey of a new technology not covered in class, or a case-based analysis of a problem. Sample projects from previous years will be posted on Canvas.

Your final letter grade is based on your ranking across sections of the class. This is expected to roughly correspond to the following distribution: 20% A and A+, 25% A-, 20% B+, 20% B, 10% B-, 5% C+ or lower. This distribution may vary. A failing grade is received when performance on a component is particularly poor (e.g., 35% or less correct answers on the final exam).

Guidelines for Project

Project Report

1. No required length (page limit). The reports will be judged on content. Sample report will be provided.
2. I will evaluate the reports for the following (the latter two will be weighed more):
 - a. Quality of information gathered (“research”)
 - b. Structured information on your own (“writing and logical presentation”)
 - c. Analysis (quantitative or based on sound logical reasoning).

Project Presentations

1. All teams must submit presentation slides as well.
2. On the last sessions, I will ask most of the teams to present the project.
3. The goal of the presentation would be to convey the basic idea under 25 minutes. You will also have a 5-minute Q&A following the presentation.
4. Additional details regarding the presentation slides and the presentation will be emailed later.

Grading Approach

There will be three components to the grades.

1. Presentation and final report assessment by the professor and TAs
2. Team presentation score from peers
3. Individual assessment of team members

As this is a group project, all team members will get the same points irrespective of the person who presents in the first two components. The third component is an individual score, to ensure that each team member has pulled sufficient weight for the team project.

Objective: The idea is to use the project to explore topics of significant interest to you (but ones we did not cover in class in great details).

Reading Materials for the Course

All readings will be posted online. All copy-right materials will have to be provided on study.net. (See course website for updates as we proceed). You can also find most of the materials online if you choose not to purchase the reading materials.

Each class will have an assignment in Canvas where you will find the reading requirements as well as other goals.