MIT Sloan School of Management
15.276 Communicating With Data
Spring 2016

Faculty	Office	Phone	E-mail
Miro Kazakoff	E62-327	202-489-4798	mirok@mit.edu
Nina Birger	N/A		
Nicole Stutz	N/A		

Schedule

Monday & Wednesday
10:00 AM - 11:30 AM ; 11:30 AM - 1:00 PM
Room: E25-119

Course Overview

This course will equip you with the strategies, tactics, and tools to use quantitative information to inform and persuade others. In an era where any skill or tool can be learned without expensive formal education, effective communication skills set people apart and are the foundation of successful careers. This class focuses on how to effectively communicate quantitative information in businesses contexts in order to drive people and organizations to make better decisions.

15.276 develops these skills with a heavy focus on the cycle of practicing, reflecting, and revising. You can expect to receive extensive, personalized feedback from the teaching team and each other.

Course Objectives

By the end of the semester, students in this class will be able think strategically about how to use data to inform and persuade others. Students will learn how to:
- Create effective data visualizations
- Present data verbally and in written form for maximum impact
- Create persuasive communications anchored in data

Course Expectations

Student can expect detailed feedback from instructors, TAs, and classmates. Because this class has limited reading and focuses on practice, we expect students to:
- Attend every class session
- Actively participate
- Provide respectful, thoughtful, and concrete feedback to peers
- Be willing to risk discomfort in order to try new skills

Text, Materials, and Website

Required   This class has no course reader.

Optional   Lynn Russell, Guide to Presentations, 4th edition, 2013
              Edward R. Tufte, The Visual Display of Quantitative Information, 2nd Edition, 2001

Websites   15.276 materials can be found on our Stellar website at:
              http://stellar.mit.edu/S/course/15/sp15/15.276/

Assignment Summary

You will deliver your H1 Information Presentation and H2 Persuasive Presentation in class. Two to three students will present in each class session. Sign-ups will be posted in the 2nd week of class.

ASSIGNMENTS	% of GRADE	DUE	Length
Class Participation & Attendance	30%	Ongoing	N/A
Initial Self-Assessment	3%	Class 2 (2/4)	2 pages
H1 Informational Write up, Presentation, & Reflection		**Scheduled through H1, 2-3 students per class**	
Written Summary	5%	9am, 5 days before pres	~500 words & visual
Class Presentation	5%	As scheduled	5 minutes
Self-Assessment	5%	9 am, 3 days after pres	2 pages
Feedback #1 to classmate	2.5%	Before 9 am,	½ Page
Feedback #2 to classmate	2.5%	2 days after presentation	½ Page
H2 Persuasive Write up, Presentation, & Reflection		**Scheduled through H2, 2-3 students per class**	
Written Summary	7.5%	9am, 5 days before pres	~1000 words & visual
Class Presentation	7.5%	As scheduled	7 minutes & 3 Q&A
Self-Assessment	5%	9 am, 3 days after pres	2 pages
Feedback #3 to classmate	2.5%	Before 9 am,	½ Page
Feedback #4 to classmate	2.5%	2 days after presentation	½ Page
Team Presentation			
Target, Audience Analysis	1.0%	Class 13 (3/22)	
Draft Slide Deck	1.0%	Class 17 (4/12)	
Class Presentation	15%	5/8 or 5/10	20 minutes & 5 Q&A
Final Self-Assessment	5%	Final Class (5/17)	2 pages
Note: Students **must revise at least one assignment.** Failure to do so will deduct 0.5 points from your lowest graded assignment. The Team Presentation and Final Self Assessment are not eligible for revision.			

PARTICIPATION & ATTENDANCE (30%)

Communicating with Data is a highly interactive class. The single most significant component of your grade is participation. For top marks, attend and contribute at least one substantive comment every class.

Participation in each class will be graded on a 0-9 scale according to the following standard:
- Attends class and engages with the topic by actively participating in class discussion = 9
- Attends class and participates with at least one comment during class discussion = 8
- Attends class, and listens actively (does not participate verbally) = 7

- Excused from class and completes a write-up = 6
- Excused from class does not complete a write-up = 3

- Unexcused from class and completes a write-up = 3
- Unexcused from class does not complete a write-up = 0

Excused absences are absences beyond your control. They include illness, injury & religious observance. Except in the most extreme circumstances, excused absences will only be granted if the student contacts the professor or TA **before** class. This can be as short as an email saying you are not able to attend (for an excused reason) and will follow up later. The student and the TA will coordinate to establish a reasonable timeframe for you to complete a write-up for additional credit.

Athletic competitions may be excused with prior permission of the professor (at least two weeks before), and must complete a write-up within 72 hours of class to receive any credit.

Except in exceptional cases, students will not be allowed more than two excused absences.

Class Write-ups are a written summary of the class. They show that you have watched the video of class and internalized the content. Since this class does not have required reading, all of the information that you will be graded on will be shared in class. As a result, we expect you to do a write-up of any class you miss.

GENERAL ASSIGNMENT DETAILS

Disciplined practice builds skills quickly. Many of the assignments are timed to allow the faculty to give you feedback quickly enough for you to incorporate it into future assignments. As a result, late work will both receive lower marks and not receive faculty feedback in a timely fashion.

Please note the following details which apply to all assignments.

LATE POLICY
Most assignments are marked on a 0-10 scale. For every part of a day that an assignment is late, 0.5 points will be deducted. **We will not accept assignments more than 72 hours after their due date.**

REVISION REQUIREMENT
You may revise any assignment, and must revise at least one. You may revise as many assignments as you like. The final grade for revised assignments will be the average of the original grade and the revision grade.

You **must revise at least one assignment.** Failure to do so will deduct 0.5 points from your lowest assignment grade. All graded assignments during the semester are eligible for revision, except the Team Presentation and Final Self Assessment.

VISUALIZATION REQUIREMENT
This class will use Tableau to create visualizations. Tableau is a common industry tool for analyzing data and creating visualizations. It tends to default to many (but not all) of the current state-of-the-art best practices in visualization. Your knowledge of this tool will enhance your credibility in the job market.

You will create (or recreate) all of the visualizations you use for this class so that they conform to state-of-the-art best practices and are seamlessly incorporated into your assignments. You may redraw graphs from other sources, but you may not copy them as images straight into your documents. In some cases this may require estimating some data points. We expect all presentations and visuals to conform to the best practices we teach.

INITIAL SELF ASSESSMENT (5%)

Your initial Self Assessment is an **up to two page paper** intended to introduce yourself to the faculty so that we can support you in developing whichever skills you want to focus on.

The audience for this document is your instructor and TA. Please cover the following:
- Your experience and comfort level communicating with data orally and in writing
- Context on the types of data or information you feel more comfortable with and what types of data or information you find more challenging to convey
- One or two areas of potential improvement you hope to focus on over the semester
- Basic biographical background (so that we have it in one place) including your class year, intended course of study and any thoughts on future goals beyond MIT[1]
- Anything else you think the faculty ought to know about you, especially issues that would limit your ability to fully participate in our class

While the content will be more personal than most assignments, we expect the format and language to be clear, direct, and professional. The highest grades will be given to the papers that:
- Organize information the most coherently and clearly for the reader, including the presence of an introduction, a conclusion and appropriate transitions between sections
- Use the introduction to **summarize and synthesize** the key message of the paper
- Take advantage of document design by labeling your sections with headings and using other forms of emphasis to increase readability
- Are free of spelling, grammatical, and punctuation errors

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[1] "I don't know" is a perfectly acceptable answer to your intended course of study or future intentions

Individual Presentations with Written Summary and Self-Assessment
H1: Explain a piece of quantitative data (20% overall)
H2: Persuade us with quantitative data (25% overall)

You will prepare a multi-part assignment in both the first and second half of the semester that includes a written summary, a presentation, a self-assessment of your presentation and feedback to two classmates on their presentations.

The audience for the summary and presentation in both assignments is your fellow students and faculty. You should assume the audience is sophisticated, but not necessarily familiar with your topic. While you may not repeat a presentation you have given in another context, you are encouraged to draw on areas of personal or academic interest where you already have some familiarity.

The process and grading for the assignments will be very similar between H1 and H2. The chart below outlines the key differences between the H1 assignment and the H2 assignment. On the next page is a guide to topic selection for each assignment followed by details on each of the assignment components.

	H1	H2
Topic	Explain a piece of quantitative information to the class. (i.e. a graph, chart, data point, or study result)	Persuade the class to change our actions, beliefs, or understanding of something. Support your argument with quantitative data.

ASSIGNMENT COMPONENT	DUE	H1 % of GRADE	H2 % of Grade	H1 Length	H2 Length
Written Summary	9am, 5 days before pres	5%	7.5%	~500 words & visual	~1000 words & visuals
Class Presentation	As scheduled, 2-3 Students per class	5%	7.5%	5 minutes	7 min & 3 min Q&A
Self-Assessment	9 am, 3 days after pres	5%	5%	2 pages	2 pages
Feedback #1 to classmate	9 am, 2 days after presentation	2.5%	2.5%	½ Page	½ Page
Feedback #2 to classmate		2.5%	2.5%	½ Page	½ Page

H1 & H2 Topic Selection

Sample H1 Topics

For H1, you will explain a piece of quantitative information to your classmates in a written summary. You will then deliver the same information verbally during class. Finally, you will reflect on the effectiveness of your approach in a reflection paper directed to the professor and TA.

For this assignment, quantitative information can broadly mean any measurement, finding, study, analysis or calculation. For most students, we expect that you will pick a graph, chart or other visualization and explain both what it means and why we should care. Make sure to focus on the meaning and impact of your selected data, in addition to explaining what it shows. You are encouraged to pick a topic that you care about.

Example topics include:
- The results of an analysis performed for another class. For example:
    - How to use an optimization algorithm to determine who should receive kidney transplants
    - How a local bagel bakery can reduce cost by changing how it sources ingredients
- A statistic or metric related to a topic you care about. For example:
    - How Fenwick measures can help us better understand a hockey team's success
    - How the success of "Hamilton" has changed the economics of Broadway musicals
    - How adoption patterns of social networks in Asia open up an opportunity for your startup
- A finding or metric reported in the news. For example:
    - How education levels better predicted Presidential voting than income levels
    - How recent studies improve our understanding of which startups are likely to succeed
    - How an analysis of screen time by gender suggests systematic bias in Hollywood

If you have any doubts about the appropriateness of your topic, discuss it with the teaching faculty.

Sample H2 Topics

For H2, you will persuade the class to change our actions, beliefs, or understanding of a topic. **A substantial part of your argument must be supported by quantitative data.** You will then reflect on the effectiveness of your approach in a reflection paper directed to the professor and TA.

Successful students have tended to pick topics that are of interest to many members of the class, but not necessarily everyone (e.g. social issues, sports, entrepreneurship).

Past topics include:
- We should support investment in vocational education for high schoolers
- We should take up meditation
- We should support better regulation for Daily Fantasy Sports sites
- We should bet on the Golden State Warriors to win the NBA Championship
- We should support movements to make public colleges free
- We should oppose oppose efforts by the government to compel companies to provide user information
- We should support legislation requiring technology companies to provide user information to law enforcement

If you have any doubts about the appropriateness of your topic, discuss it with the teaching faculty.

H1 & H2 ASSIGNMENT DETAILS

The next four pages outline the assignment components of the H1 and H2 assignments. Both assignments require: a written summary, a presentation to the class, a self-assessment, and feedback to two classmates.

WRITTEN SUMMARY (H1: 5%; H2: 7.5%)

As a companion to your presentation, you will write an email intended for classmates unable to attend your presentation. Your email should serve as an effective substitute for attending your presentation.

The summary is **due by 9 am 5 days before your presentation**. This way faculty can provide you feedback with enough time to incorporate it into your class presentation. Please email your summary to the Faculty and TA. Summaries of Monday presentations will be due by 9am on the preceding Wednesday morning; Assessments of Wednesday presentations will be due by 9am on the preceding Friday morning

The ideal length for your summary is the minimum number of words required to convey your ideas. There is no required word count, but we expect most **H1 summaries to be 400-600 words long** and most **H2 summaries to be 500-1000 words long**.

The write up **must include at least one data visualization**, but it does not have to include all (or even the same) visualizations that are in your oral presentation. As always, the selection you make should be appropriate for the audience, the medium and the message. Since this is a written medium, we expect there to be significant differences in depth and approach from the oral presentation. **This should not be your script for the oral presentation.**

The highest grades will be given to the papers that:
- Take advantage of the email subject line to reinforce their main point
- Synthesize your key message and present it within one scroll of the email on a smartphone
- Clearly explain your key point(s)
- Organize information coherently and clearly for the reader. In most cases, this will mean multiple sections
- Include visualizations thoughtfully, and explain them clearly in the text
- Use an appropriate tone for the audience and nature of the topic
- Take advantage of document design through **headers and other forms of emphasis** to increase readability
- Be free of spelling, grammatical, and punctuation errors

PRESENTATION (H1: 5%; H2: 7.5%)

You will create, rehearse and deliver a presentation to the class.

In H1: You will have **up to 5 minutes** to deliver your presentation. The focus of your presetnation will be the implications illustrated by **at least one** data visualization. You must create (or re-create) this visualization yourself. Your visualization may be presented on a slide or print-out. The medium you choose for your visualization should fit the complexity of the data and the goal of your presentation.

In H2: You will have **up to 7 minutes** to deliver your presentation and **take an additional 3 minutes of questions from the audience**. We expect your presentation to be accompanied by projected visual aids (e.g. PowerPoint). You may also choose to supplement the presentation with handouts if appropriate for the complexity of the data and the goal of your presentation.

The most effective presentations will:
- Have a clear structure with an introduction, middle and conclusion
- Include the key components of an effective introduction
  - An attention grabbing hook
  - The key thing you want us to know or persuade us of
  - An explanation of "why we should care"
  - Some evidence of your credibility
  - A preview of the structure in order to help the audience follow
- Verbally mark transitions between points
- Explain data clearly and at an appropriate level for the audience
- Include the key components of an effective conclusion
  - Recap your key points
  - End on the main point you want us to take away
  - Stick the landing (i.e. End on a clear emphatic statement that signals you are done)
- Create visuals that conform to best practices (and are used as aids, rather than a script)
- Use the principles of TOT-P present data
- Demonstrate effective use of the tools of verbal and non-verbal delivery
- Demonstrate effective Q&A techniques (in H2 presentation)

Post-Presentation Self-Assessments

Your Post-Presentation Self-Assessment **is an analysis of the effectiveness** of your presentation, **not a recap** of your preparation process**.** Every presentation will be recorded. You should review this recording in order to reflect on how you performed. Your self-assessment should focus on which aspects of your strategy, structure, content, delivery, and preparation were effective and which need improvement. The Self-Assessment should be clear, concise, insightful, and designed to facilitate rapid information transmission.

The audience for this document is your professor and TA.

Self assessments should be no more than 2 pages long and are due by 9 am, 3 days after your presentation. Assessments of Monday presentations will be due by 9am on Thursday morning; Assessments of Wednesday presentations will be due by 9am on Saturday morning

Your self-assessment should include the following:
- What was effective about the strategy and structure of your talk? What was ineffective?
- What was effective about the content of your talk? What was ineffective?
- What was effective about the delivery of your talk? What was ineffective?
- How did your preparation process impact the success of your presentation? What aspects of it were effective or ineffective?
- What will you do differently in the future in order to improve?

We expect the format and language to be clear, direct, and professional. The highest grades will be given to the papers that:
- Show evidence you have watched the video.
- Organize information the most coherently and clearly for the reader, including the presence of an introduction, a conclusion and and appropriate transitions between sections
- Synthesize your key learnings and share them **in the introduction.**
- Take advantage of document design by labeling your sections with headings and using other forms of emphasis to increase readability
- Are free of spelling, grammatical, and punctuation errors

Feedback to classmates (2.5% for each)

You will provide feedback to two of your classmates' presentations in each half of the semester (four total). This assignment is designed to sharpen your ability to deconstruct effective communications as well as provide everyone more sources of feedback.

A feedback form will be distributed. Students will receive full credit for the assignment if it:
- Is on time
- Provides specific support for each piece of feedback.
  - Don't say "You were authentic."
  - Say: "Your consistent eye contact with the audience made your presentation feel authentic."
- Is constructive and useful. Do this by focusing on tactical improvements the presenter could make and why you think that would be useful:
  - Don't say: "You were confusing."
  - Say: "At 5:38 in the recording, I didn't follow your explanation of how baseball team payroll drives win rates. Spending more time orienting us to your graph and reducing elements on the graph might have helped me better understand your point."

The audience for this assignment is your classmate, **but send it to the professor and TA so that we can review it before forwarding it on.** If your feedback isn't specific, tactical and kind, we will ask you to revise the assignment.

Team Presentation (Presentation: 15%; Preparation materials: 2%)

The capstone assignment for the semester is your team presentation. This is designed to mirror a professional environment where large work projects are often divided up and then synthesized at the end. Everyone on your team will receive the same grade.

Your team will identify an organization on campus and create a presentation designed convince decision makers in that organization to change something. You should plan to use any and all relevant persuasive techniques, but we expect a significant part of your argument to be grounded in data gathered from secondary sources or by your team. Given that many team will be suggesting process changes, we expect to see process and flow diagrams in many of the presentations as well as quantified impact. Both of these will be considered data.

Teams are encouraged to work together on forming the argument, collecting data, aiding each other with analysis, and producing a well-rehearsed compelling presentation. The focus of this assignment is the quality, clarity, and persuasiveness of the argument you make.

Students are encouraged to propose teams where they share an an interest in seeing their recommendation enacted, but faculty will make the final team assignments.

SAMPLE TOPICS
- Every dorm on campus should be allocated a dedicated S^3 Dean and mental health clinician
  - Target Audience: Chancellor Cynthia Barnhart, Provost Martin Schmidt, and Student Life Dean Suzy Nelson
- Our fraternity should increase meal service hours
  - Target Audience: House committee & governing board
- Dorm X should invest $Y to convert one of the common areas to a dedicated, quiet study space
  - Target Audience: Head of House, Area Director, Student Life
- MITERS should institute system to fine those who don't clean up their workspaces
  - Target Audience: MITERS officers

Assignment Components of Team Presentation

Though the presentation will be the primary grade for the team assignment. There are two credit/no credit assignments to help make sure your team is on track and to provide an opportunity for instructor feedback.

Target, Audience Analysis - Due Class 13; March 22 (1%)

By class 13, each team should have identified an organization and a proposed change. Each team should submit the Project Overview & Audience Analysis Form. In class we will allocate time for each team to develop a workplan.

The assignment will be graded on a Credit/No Credit basis.

Workplan & Slide Outline - Due Class 17; April 12 (1%)

By class 17, teams should have a draft argument, slide deck outline and have begun collecting data.

Teams should submit an argument outline in the form of a Minto Pyramid, a draft slide deck and up to one page covering the following:
- What data you expect to collect and how you will collect it? (or is it already collected)
- Which aspect of the research and presentation each student will be responsible for?
- Are there any likely challenges either internally or externally that the teaching team should be aware of?

Grades will be on a Credit/No Credit basis. Teams that appear to have thought through the project, convey information coherently, and have a (reasonable) plan will receive full credit.

25-Minute Team Presentation - In class 24 or 25 (15%)

Each team will create, rehearse and deliver a **20-minute presentation** with an **additional five minutes of Q&A** and **one minute of context** setting before the presentation. The presentation will be strictly timed and **every student in the team must present**.

In addition all of the components of effective presentations identified earlier, these presentations will:
- Make the recommendation and/or "ask" clear early in the presentation
- Establish your credibility as a team to make this recommendation
- Frame your recommendation and arguments around the benefits of your plan to the decision makers
- Look like the work of a cohesive team by
  - Previewing an argument that is followed through the presentation by different speakers
  - Being consistent in verbal style and tone throughout the presentation
  - Being consistent in visual style throughout the presentation
  - Showing evidence of multiple rehearsals
  - Transitioning seamlessly between presenters
  - Handling Q&A effectively as a team

FINAL SELF & TEAM ASSESSMENT (10%)

Your final Self Assessment is a **two page write-up** intended to reflect on what you have learned through the semester and what you hope to continue working on. The audience for this document is your instructors and TA.

Please cover the following:
- Identify at least one key learning you have had in each of the following over the semester
  - How to structure data based communications
  - How to deliver data based communications
  - How to design and create data visualizations
  - How to work in a team to collect and present persuasive data
- What you learned from the Team Project
  - There should be evidence in your reflection that you have watched the recording of your team's presentation.
- At least two areas of potential improvement and what you will do to develop those areas (see note below on SMART goals)

The highest grades will be given to the assessments that:
- Provide the summary of your key learnings at the beginning of the paper
- Organize information coherently and clearly for the reader
- Take advantage of document design through headers and other forms of emphasis to increase readability
- Are free of spelling, grammatical, and punctuation errors

On Goals for future improvement

Students often submit self-assessments with vague or impossible goals. To be useful, aim to create SMART goals around your targeted areas of improvement. You do not have to instutite the plan you propose, but we hope you will. To make this more likely, consider small tactical SMART Goals. SMART Goals are:

Specific
Measurable
Achievable
Realistic
Time Based

For example, a vague and unrealistic goal would be "I want get rid of presentation anxiety."
A SMART version might be:

I want to reduce nervous movement when I present.	Specific
I will ask a friend to record every time I speak in front of a group; I will count the number of times per minute I move	Measurable
And aim to lower that number by 50%	Achievable, Realistic
By the end of year	Time Based

Class	Date	Topic	Assignment Due
1	2/8	Course Introduction	
2	2/13	Data Visualization & Graph Basics	Initial Self-Evaluation
3	2/15	Tools Day (bring your laptop)	
4	2/21[2]	Structure & Written Delivery	
5	2/22	Verbal Delivery	
6	2/27	Basic Design Choices (Color, Scale & Simplicity)	Student Presentations
7	3/1	Argument Formation I (Structure & Goals)	Student Presentations
8	3/6	Argument Formation II (Audience Analysis)	Student Presentations
9	3/8	Argument Formation III (Narrative)	Student Presentations
10	3/13	Advanced Graph Choices (Annotate & Aggregate)	Student Presentations
11	3/15	Presentation Design	Student Presentations
12	3/20	Q&A: Defending Your Data	Student Presentations
13	3/22	Working with Data in Teams	Student Presentations; Team Topic Proposal
		Spring Break	
14	4/3	Advanced Viz I (Visual Processing Basics)	Student Presentations
15	4/5	Speaker 1	Student Presentations
16	4/10	Advanced Viz II (Diagrams & Process Flows)	Student Presentations
17	4/12	Speaker 2	Team Slide Outline; Student Presentations
		Patriot's Day	
18	4/19	Advanced Viz II (Maps & Representative Viz)	Student Presentations
19	4/24	Advanced Viz III (Dashboards)	Student Presentations
20	4/26	Data in Crisis Simulation	Student Presentations
21	5/1	Data in Crisis Debrief	Student Presentations
22	5/3	Data Impromptus	Student Presentations
23	5/8	Speaker 3	
24	5/10	Team Presentations (1 of 2)	
25	5/15	Team Presentations (2 of 2)	
26	5/17	Course Finale	Final Self-Assessm

[2] Note this class is on Tuesday due to Monday Holiday