Emory University
Goizueta Business School
BUS – 458 The Psychology of Technology (Fall 2012)

Instructor: MJ Prietula, Professor, GBS 410, prietula@bus.emory.edu
Course: Tue, Thu (1pm – 2.15pm); GBS Room 421
Hours: Tue, Thu (after class), other days (arrange), email is easiest

The overarching goals of this interdisciplinary course are:

- to understand our *interactions with technology* in individual, social, and other contexts (e.g., business, customer, government, social)
- to understand the *design issues* that underlie those interactions and provide value
- to focus more on *current and future technologies*, with an eye toward important thoughts of the past and possible thoughts of the future

The core element of the course is understanding how people interact with technology – in particular, information technology. From a business (or political or humanitarian) perspective, you can engage information technology to help achieve your goals. But how? The answer resides in the psychology of design. You may be involved in the design, evaluation or use of systems that interact with individuals or groups. On one hand, you may not be the developers, but could likely be on the design team, either with a traditional firm or on the entrepreneurial stage. On the other hand, all of you are users of such systems, ranging from web-based interactions to the iPad platform. From a manager’s or a designer’s perspective, what should you do to craft a better design to reduce error or frustration? To get more reliable results? To better and more efficiently inform or communicate? From an IT/Strategy perspective, how can technology contribute to the business model?

How does social media fit into today’s business strategies? How is technology used to fool, dupe, or influence users? Can technology be “smart” or “intelligent”? Can technology be “emotional”? We will explore topics ranging from ubiquitous computing and convergence, to agents, robots, androids and aspects of the digital divide. We will also examine the worlds of computer games and social media, and address the recurring issue of hacking and privacy. Woven throughout the course will be topics of informational ethics. This is a “big picture” course that is multi-disciplinary in its ideas and its applications. The course is mostly qualitative rather than quantitative, but you will be reminded often of applicable principles related to understanding research, which underlies evidenced-based methods. It covers principles applicable to Strategy and IT Consulting. You will be able to tune this course to your own interests and link it to your personal or professional goals.

We will explore topics ranging from ubiquitous computing and convergence, to agents, robots, androids and aspects of the digital divide. We will also examine the worlds of computer games and hacking, and address the recurring issue of privacy. Many issues regarding ethics will emerge. For most of these topics, we will examine the theory, the research, and pragmatic (i.e., simple) techniques and methods you can apply in your life, or in your job, immediately. We will examine how research is conducted to discern real effects versus opinion.

**Prerequisites:** There are no prerequisites for this course. It is a “big picture” course that is cross functional and multi-disciplinary in both its ideas and its applications. The course is mostly qualitative rather than quantitative, but you will be reminded often of applicable principles related to understanding research. There is no programming requirement.
Science, Culture & Society. This course also counts as an elective in the Science, Culture & Society minor at Emory.

This course counts as GBS ISOM depth elective as well as the Business & Society depth elective.

Class Procedures: You will be expected to read the assigned material, be prepared to intelligently discuss the material in class, and complete any assigned exercises before class. This class, as an upper level elective, will be highly interactive and require your presence and informed participation. More importantly, there is a significant class project that allows you to mold aspects of the course to your specific interests.

Grading

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework (4)</td>
<td>40%</td>
</tr>
<tr>
<td>Exams (2)</td>
<td>35%</td>
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<tr>
<td>Final Project</td>
<td>20%</td>
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<tr>
<td>Participation, etc.</td>
<td>5%</td>
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</tbody>
</table>

There will be four homeworks. There will be one team Final Project and two in-class exams (closed notes). These will be explained in detail later. Grades will necessarily follow the recommended GBS distribution, but “A” grades will be based on comparatively excellent performance that demonstrates initiative, innovation, and understanding in class, in the exams and in the homework.

Computer/Phone Policy

Please do not use laptops (etc.) during class unless requested to do so by the instructor. Take notes with pen/pencil and paper. Turn off all audible alarms and ringers on cellular phones. (Hey, isn’t this a technology course?) Nope. It is a discussion course about technology. I will be teaching a “social simulation” elective next year — that is a technology course.

Attendance

Attendance is, of course, required, and so is presence. Attendance means that you are physically present for class, and mentally prepared. That is, you have conducted the required tasks before class starts. Lack of attendance or lack of presence/preparation will obviously impact your grade. Participation will include “informed student led” discussions. The purpose is for you to demonstrate understanding and lead discussion of a particular topic of interest to you. Preparation will include finding on your own relevant articles on the topic that will be discussed in class.

Rules of Presence

You are expected to participate in class discussions.
You have a right to your opinion and may express it.
You must grant that right to others.
You must respect others by not disrupting the class.
Cold Calls

The policy for the class is to assume you are prepared and I will call on you to summarize, lead the class on a topic, or generate discussion questions. If you are not prepared, please inform me prior to the start of class. I may call on you to begin the discussion for the day on the readings.

Ethics and Code of Conduct

All students are expected to adhere to the Emory Honor Code.

Class Conference

You are expected to monitor the class conference for important (okay, and not so important) information.

NOTE: Core resources (e.g., articles, TED talks, “classic” readings) are listed in the syllabus and will generally be posted on our conference, or indicated via its URL. However, we will rely mostly on current resources that will be assigned opportunistically as events unfold each week. Suggestions for relevant articles, etc. from the class are encouraged for the topics addressed. The questions listed in the syllabus for each meeting try to present the issues and perspectives we want to discuss for that (those) sessions.
## Schedule (subject to change as events unfold)

<table>
<thead>
<tr>
<th>Week</th>
<th>Meeting</th>
<th>Date</th>
<th>Title</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Aug 30</td>
<td>“Who am I and why am I here?”</td>
<td>Intro to course, topics, grading, approach, Form groups, hand out practice guidelines</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Sep 4</td>
<td>“Cool. I want one.”</td>
<td>Examine some innovative applications, Assignment 1 distributed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Group practice presentations</strong></td>
<td></td>
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<tr>
<td>3</td>
<td>3</td>
<td>Sep 6</td>
<td>“I think we have a problem...”</td>
<td>An analysis of problem solving</td>
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<tr>
<td>4</td>
<td>4</td>
<td>Sep 11</td>
<td>“Wait, what would Don do?”</td>
<td>Design matters... but what is it?, Assignment 2 distributed</td>
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<tr>
<td>5</td>
<td>5</td>
<td>Sep 13</td>
<td>“That is so CUTE! What is it?”</td>
<td>Emotion and design</td>
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<tr>
<td>6</td>
<td>6</td>
<td>Sep 18</td>
<td>“Are websites people?”</td>
<td>Your brain and “others”</td>
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<td></td>
<td>7</td>
<td>Sep 20</td>
<td>“Oops.”</td>
<td>Technology, error, and analysis</td>
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<tr>
<td>7</td>
<td>8</td>
<td>Sep 25</td>
<td>“Where do we start?”</td>
<td>What does a design project look like?</td>
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<tr>
<td></td>
<td>9</td>
<td>Sep 27</td>
<td>“Hi. What’s your business model?”</td>
<td>How a company hopes to make money, or...</td>
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<tr>
<td>8</td>
<td>10</td>
<td>Oct 2</td>
<td><strong>Guest Speaker</strong></td>
<td>RUVR?</td>
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<tr>
<td>11</td>
<td>Oct 4</td>
<td></td>
<td>“But what is the project about?”</td>
<td>Class Project Distributed</td>
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<tr>
<td>12</td>
<td>Oct 9</td>
<td></td>
<td>No meeting: Online Qs</td>
<td>Assignment 3 distributed</td>
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<tr>
<td>13</td>
<td></td>
<td>Oct 11</td>
<td><strong>Exam I</strong></td>
<td>No notes.</td>
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<td>14</td>
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<td>15</td>
<td>15</td>
<td>Oct 23</td>
<td><strong>Guest Speaker</strong></td>
<td>Exploring some AI species</td>
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<td>16</td>
<td>Oct 25</td>
<td><strong>Guest Speaker</strong></td>
<td>When (real) viruses attack! Can tech help?</td>
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<td>17</td>
<td>17</td>
<td>Oct 30</td>
<td><strong>Guest Speaker</strong></td>
<td>1001011? 0000001!</td>
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<tr>
<td>18</td>
<td>Oct 1</td>
<td></td>
<td>“Somewhere in a Colossal Cave...”</td>
<td>What actually is a game?</td>
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<tr>
<td>19</td>
<td>Nov 6</td>
<td></td>
<td>“Ow..that hurt!”</td>
<td>Can interacting with technology harm, Assignment 4 distributed</td>
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<td>20</td>
<td>Nov 8</td>
<td></td>
<td>“10^{37} ants can’t be wrong!”</td>
<td>Mining information from crowds</td>
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<tr>
<td>21</td>
<td>Nov 13</td>
<td></td>
<td>“Hey, am I data?”</td>
<td>Social media, social data</td>
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<tr>
<td>22</td>
<td>Nov 15</td>
<td></td>
<td>“I know a guy who knows a guy...”</td>
<td>Social data, social networks</td>
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<tr>
<td>23</td>
<td>Nov 20</td>
<td></td>
<td>“…who knows a guy who…”</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Assignment 4 Due</td>
</tr>
<tr>
<td>24</td>
<td>Nov 27</td>
<td></td>
<td>“u spak eblish?”</td>
<td>Black hats and white hats</td>
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<tr>
<td>25</td>
<td>Dec 4</td>
<td></td>
<td>“Does access matter?”</td>
<td>Disparities in access to IT</td>
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<tr>
<td>26</td>
<td>Dec 11</td>
<td></td>
<td><strong>Exam 2</strong></td>
<td>No notes. Not cumulative.</td>
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<tr>
<td>27</td>
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<tr>
<td>28</td>
<td>Dec 14</td>
<td></td>
<td>Final Projects Due</td>
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Schedule (Detailed)

Meeting 1.

Episoe: “Who am I and Why am I here?”
Introduction to The Course and what it will cover; Introduction to each other.

Guide
1. Understand the general goals of the course; recognize and note the requirements and schedule for achieving them.
2. Introduce yourself to the class and explain what your objectives are for the course (okay, what they are today).
3. What are the most important technologies you interact with every day… and why? What roles do they play in your life? How do you interact with these technologies? How has technology changed your lives?
4. Consider what job you are seeking or what your personal goals are. How does this course fit in? How can you tune the course to your own goals (suggested readings, websites, course project)?
5. What specific additional topics would you like to see addressed in this course?
6. In this meeting you will form teams of no more than four individuals.

Resources:
1. Consider the classic developments in Apple that began here. And here. And here. And here.

Meeting 2.

Episode: “Cool. What does it do?”
There are a variety of technology platforms available. Let’s consider some interesting applications on those platforms. Oh, now what might we mean by technology? What is a good definition for you?

Guide
1. Watch these videos. What are they talking about? What are the applications? Why are the applications interesting? Be familiar with the talks, applications, and issues of each.
2. Why do people use computers? This is an important question. It suggests that people use computers for some purpose of value or necessity. What are the purposes in these examples?
3. In this class your group will select one innovative application of technology (not the one’s below) and make a presentation to the class using one slide. What the slide will contain and its form will be explained.

Resources:
1. Mike Matas’s TED talk on next-generation digital books. [here] [Al Gore – Our Choice: A Plan to Solve the Climate Crisis is downloadable to iPhone/iPad… not needed for the course.]
2. Raghava KK’s TED talk shows a children’s book. [here]
3. Peter Norvig’s TED talk on the 100,000 student classroom. [here]
4. Patrick Chappatte’s TED talk on the power of cartoons. [here]
5. Keven Kelly’s TED talk on what technology is and how technology evolves. [here]
Meeting 3.

**Episode:** “Okay, let me figure this out…”

At a fundamental level, why do people use technology? This is an important question. It suggests that people use computers for some purpose of value or necessity (job-related, entertainment-related, task-related). Here we will develop a simple approach to describe many of these situations (GEER) that will help when you do an analysis and present a foundation for designing such interactions, whether they are via a direct application, over a corporate intranet, or open to the web itself. This method (one of many) centers around a single question: how do people solve problems?

**Guide**
1. Define problem solving.
2. Describe how people solve problems or do tasks
3. What are weak and strong methods?
4. What is the knowledge vs. search tradeoff?
5. What is a task environment and problem space?
6. What makes a problem difficult?
7. What role does GEER analysis play?

**Reading(s):**
1. *Simple GEER Notes. (to be handed out)*

Meeting 4.

**Episode:** “Wait, what would Don do?”

This extends the prior discussion and begins to consider design as the key process in how we determine (and predict) interactions with our devices. We will examine the issues, see some examples, and consider the implications. Now, Don Norman is one of the core thinkers about how humans interact with technology, and how we should think about designing technology that interacts with humans. Here is an small (but relevant) sample of his thoughts.

**Guide**
1. What is design? (Okay, lots of definitions… what is yours?)
2. What are the key assertions and observations made in these readings?
3. What is sociable design?
4. What is design thinking?
5. How can you apply what you have learned from these readings to a design problem?

**Resources:**
1. D. Norman. People Are From Earth, Machines Are From Outer Space. [here].
Meeting 5.

**Episode:** “That is so CUTE! What is it?”

Why do some designs cause positive immediate positive reactions and why do others result in immediate negative ones? Why do we yell at computers (and lawnmowers)? Here we briefly examine the role of emotion and consider how that can be used in design of interfaces and how the implications of this in social interaction over the web. We examine a simple explanation of the role emotion can play when interacting with technology.

**Guide**
1. What are emotions? What are feelings? Are they different?
2. What role do emotions play in design?
3. Find some technological objects or applications that generate positive and negative reactions (not by their content, but by their form).

**Resources:**
1. Norman, D. *Emotional Design: People and Things.* [here]
2. Norman, D. Emotion & Design: Attractive things work better. [here]
3. D. Norman’s TED talk: 3 ways good design makes you happy. [here]
4. R. Seymour’s TED talk: How beauty feels. [here]
5. Norman, D. *Epilogue: We are all designers.* [here]

Meeting 6.

**Episode:** “Are websites people?”

You (or your customers) interact with technology and what is at the other end may not be real. The use of avatars and agents are increasing. The use of voice recognition is increasing. Does that matter? If so, how can you use that to your (select one: entertainment, advantage …)?

**Guide**
1. Go to SitePal [here] and play with it, for example [here]. How can you use it?
2. Think about the last time you interacted with an automated help agent on the phone. What was that experience like?
3. Let’s start to think about how this might be applied to human-tech interaction.

**Resources:**
2. Fogg, B. J. (2002). *Persuasive technology: Using computers to change what we think and do.* Morgan Kaufmann, Chapter 5. [to be posted]
Meeting 7.

Episode: “Oops.”
There are some interesting theories of errors. The infusion of technology in our lives has interesting consequences for error. Errors matter. What kind of errors are there? How do we measure error? What sorts of mitigation strategies can we employ? We will use some simple observations to examine potential error sources.

Guide
4. What are errors?
5. Why are errors?
6. What are consequences?
7. What can we do about them?

Resources:
3. Air France crash ‘due to pilot and technical failings’ [here]

Meeting 8.

Episode: “Where do I start?”
How might a project look like that involves designing interacting with technology? Of course, there are widely different methods for handling projects, so we will focus on some common and useful concepts that could involve you as a user or as a designer. The term “human-centered” design is now in wide use across disciplines. We will discuss the typical steps in a design task and explore an interesting heuristic model for determining aspects of competitive advantage through customer-focused design.

Guide
1. Methods handout (to be posted).
2. Understand how Ideo recognized constraints in design (i.e., what was important?) and what it meant for a solution?
3. How do people “design” their own experiences/solutions? Why take “their” perspective?
4. What is meant by “delegation” and its likely role in design?
5. What is Prestero’s “design for outcomes” concept and how might that be a general concept?

Resources:
1. Ideo’s David Kelley’s TED talk on human-centered design. [here]
2. Ideo’s Paul Bennett’s TED talk on finding design in the details. [here]
3. Nokia’s Jan Chipchase’s TED talk on the anthropology of mobile phones. [here]
4. Timothy Prestero’s TED talk on designing for people. [here]
Meeting 9.

**Episode:**  “Hi. What’s your business model?”
This is related to the prior meeting. Sure, it is important to understand how people use technology. However, it is essential to also understand (or create) the underlying business model, which describes the how an organization (any kind) creates, delivers, and captures value. Of course, you can take a variety of courses in this and when you join a firm, get full explanation of their business model in your indoctrination period. Thus, a wide variety of perspectives exists, but we will take a simple approach that addresses the key issues, and relate that type of model to how it may impact our thought on the topics in this course.

**Guide**
1. Methods handout (to be posted).

**Resources:**
1. A general discussion and examples can be found [here](#) noting the relevance of intellectual property [here](#) and methods patents [here](#).

Meeting 10.  **Guest Speaker** (details supplied later)

Meeting 11.

**Episode:**  “But what is the project about?”
In this meeting we will likely catch up on some stuff, but the main part will be a discussion of the required class project. It will be a team project. Details will be presented at this time.

Meeting 12.  This is when you should have an initial meeting discussion with your team concerning your class project. You will be responsible to sending to me the minutes from that meeting (guidelines will be sent). Also, I will be available (skype, email) any questions regarding the exam.

Meeting 13.  **EXAM I.**  Closed notes, etc. Turn off your device sound.

[Fall Break Oct 15-16]
Meeting 14.

**Episode:** “If I only had a brain!”
Humans have dreamed, predicted, and believed that “intelligence” may (or may not) be possibly exhibited by a machine.

**Guide**
2. What are the some of the implications?

**Resources:**
1. Machines. [here]
2. Dennis Hong’s TED talk on seven species of robots. [here]
3. Sebastian Thrun’s TED talk on Google’s driverless car [here]
4. Rodney Brook’s TED talk from 2003. What is interesting about this? [here]
5. David Hanson’s TED talk on robots that show emotion. [here]
6. Cynthia Breazeal’s TED talk on personal robots. [here]
7. Ray Kurzweil’s TED talk on the acceleration of technology. [here]
8. Watson. [here]

**Meeting 15. Guest Speaker** (details supplied later)

**Meeting 16. Guest Speaker** (details supplied later)

**Meeting 17. Guest Speaker** (details supplied later)

**Meeting 18.**

**Episode:** “Somewhere nearby is Colossal Cave… where others have found fortunes in treasure and gold…”
Games. Most of us play them, but the emerging nature of pervasive technologies suggest they are becoming more and more ingrained in our (and others’) culture. In our home life, in our education, in our business world, in our society. Now, what exactly is a “video” game? What types are there? What are the business models out there? How does one interact with games? How can we use games (or game-like play, called gamification) to achieve our design ends?

**Guide:**
1. What IS a game?
2. What is YOUR experience with games? What is your favorite game?
3. What “kind of game” do you prefer? Why?
4. Are interactive video games, well, “different”?
5. Go to Cynthia Breazeal’s experimental game site, download and play it. [here]

**Resources:**
1. David Perry’s TED talk on games [here]
2. Will Wright’s TED talk on Spore [here]
3. Tom Chatfield’s TED talk on video games [here]
4. Jane McGonigal’s TED talk on serious games [here]
5. Seth Priebsch’s TED talk on the game layer. [here]

Meeting 19.

**Episode:** “Yes, but it makes me itch.”
What are the negative side-effects of new (IT) technology? Are video games different than other types of games in their effect? What about the Internet in general? What about technology in general? How might we investigate effects?

**Guide**
1. Can YOU find out any recent popular press discussions on this type of topic?
2. What do you think are critical issues from your particular interest and perspective?
3. Is this an important issue? Why/Why not?
4. If you think there might be effects, what would they be? What would be the most serious?

**Resources:**
3. Internet addiction… N-steps? [here] and take the test [here]
4. Greenemeier, L. *Could cell phones stop people from texting while driving?* [here]
5. Sherry Turkle’s TED talk about being connected. [here]

Meeting 20.

**Episode:** “10^{17} ants can’t be wrong!”
How does masses of partial informed (or sometimes uninformed) individuals generate usable information, such as predictions of events?

**Guide:**
1. What are prediction markets?
2. Can a group estimate be more accurate than any of its members?
3. What are the rules of such markets?
4. How have they been used? When does it work? When might it fail?
5. Be familiar with each one below.
6. What uses can you imagine for this method?

**Resources:**
1. Read about the simexchange [here]
2. Read about the Hollywood Stock Exchange [here]
3. Read about the Iowa Electronic Markets [here]
4. Read about the Iowa Electronic Health Markets [here]
5. Read about IARPA’s prediction project [here] and view it [here]
6. Read about intrade [here]
Meeting 21.

**Episode:** “Hey, am I data?”

Okay, let’s examine socialization and connecting via the Internet. There is “socialization” and the software that enables it (social software). What do those applications do? Why are they there (really)? From a business standpoint, what are the implications?

**Guide:**
1. What networking software do you use? Your friends?
2. What is your opinion of it/Them? What is good/bad about it/them?
3. Think about WHY you use it? Who has the most popular Facebook page (today)?
4. What sort of business model can you envision with geosocial networking?
5. What sort of analytics might be useful for such data?

**Resources:**
1. Let’s look at a review of social networking sites. [here] What are YOUR criteria?
2. Now, consider the role of geosocial networking. [here]
3. How do you determine the market value of social networks? Opinions? [to be posted]
4. What if you are the boss? [to be posted]
5. How to play nicely with others at IBM. [here]

Meetings 22-23

**Episode:** “I know a guy who knows a guy.”

We are all linked to a variety of networks. From these networks (static and dynamic) we can extract a lot of information and make plausible inferences that can influence decisions. How can we find these networks, what sort of properties do these networks have and what kind of information can be gleaned from them? For us, technology plays a critical role in answering all three questions.

**Guide**
1. What is a social network?
2. What is a small world? Think of this as how to understand structure.
3. What is a scale-free network?
4. What are the fundamental concepts of networks used in analysis?
5. What are the basic network metrics use? What do they represent?

**Resources:**
1. What is the Oracle of Bacon? Think of this as a static analysis. Try it out. [here]
2. Is it a small world? Read the key Nature article by Watt’s & Strogatz. [to be posted]
3. Lazlo Barabási describes scale-free networks. What are those? [here]
4. What interesting Board of Director linkages can you find [here]
6. Unrest and consequences. [here] and [here]
7. Can media data help in combating terrorism? [here]
8. Dan Dennett’s TED talk on memes [here]
[Thanksgiving Break Oct 25-26]

Meeting 24.

**Episode:** “u spak eblsh?”
Have you been hacked? Could be. In the digital west, it is the good guys versus the bad guys. Who is winning?

**Guide**
1. What software do you use to protect you? How good is it? Is that all?
2. How are hackers represented in the media?
3. For *Frontline* (below), select ONE issue to read/discuss under each of the five sections (depicted in green: who are hackers, risks of internet’s vulnerabilities, etc.).

**Reading(s):**
1. Examples can be found for LinkedIn (and eHarmony) [here], Visa & MasterCard [here] and health care sites [here] (Emory?).
2. What are defcon [here], HOPE [here], and 2600 [here]?
3. Okay, what about Hacker Halted [here]

Meeting 25.

**Episode:** “Why did you buy an ostrich?”
Here we examine the issue of privacy. Not only is this concern not going away, but advances in technology have added new concerns and risks under discussion.

**Guide:**
1. What has been your experience with privacy? Your friend’s?
2. What options and behaviors to you use to deal with privacy and technology?
3. How do you handle security & privacy of data?

**Reading(s):**
1. Two sites dedicated to this issue are EPIC and privacy.org.
2. What about the risks of Facebook? [here]
3. News of the World phone hacking [here]. Also consider this.
5. Read Tene and Polonetsky’s discussion in the Stanford Law Review on privacy & big data. [here]

Meeting 26. **EXAM II.** Closed notes, etc. Turn off your device sound.