COURSE SCHEDULE

Week 1: August 25—Introduction to the Course

Topics:
Introductions, review of syllabus and LibGuide, completion of student survey, selection of student research topics and discussion leaders, ice-breaker exercise, other administrative information, etc.

Readings:
None

Week 2: September 1—What is Big Data & Why is it Important?

Topics:
The characteristics of big data, the three “V’s”; how does big data differ from small data?; the life-cycle of big data; the growing importance of big data; how big data is and will be affecting our daily lives; some examples of high value big data uses.

Readings:
The Human Face of Big Data," PBS (February 25, 2016) available at https://www.youtube.com/watch?v=r6v15Z60eUI (52 minutes in length)
“What is Big Data and Why Should You Care? Forbes (April 22, 2016) available at https://www.youtube.com/watch?v=jGhRiwGHh30 (2:45 minutes in length)
Week 3: September 8—**The Collection, Consolidation and Storage of Data**

**Topics:** The generators of data (e.g. social networks, mobile devices, geo-fencing, internet of things, businesses, governments, etc.); the aggregators of data (e.g. data brokers, businesses, government, etc.); data storage, data management & processing technologies (e.g. Hadoop, MapReduce, Spark, Pig, NoSQL, etc.); public and private databases.

**Readings:**


Week 4: September 15—**The Mining, Analysis and Use of Data**

**Topics:**

The ABC's of algorithms, machine learning and artificial intelligence; descriptive vs. predictive analysis; de-identification and re-identification; reliability and limitations of big data analytics.

**Readings:**


Homework/classroom activity on the use of machine learning for building a model.

Week 5: September 22---An Overview of the Potential Benefits & Dangers of Big Data

Topics:

The benefits of better decision-making, financial gain & advancing social good; the risks of bias, discrimination, exploitation, inequity and inequality; loss of privacy and surveillance and tracking by business and government;

Readings:


Week 6: September 29--- A Deeper Dive into Algorithms & Fairness Issues

Topics:

What are the different types of algorithms? How do they work? Are algorithms fair, discriminatory, racist, biased etc.? Can they substitute for human judgment? Transparency, accountability and ethical issues issues.

Readings:


How big data is unfair. Moritz Hardt. Available at https://medium.com/@mrtz/how-big-data-is-unfair-9aa544d739de#.69j789w6z
Week 7: October 6---The Regulation/Governance of Big Data

Topics:

Existing laws, regulations, policies and best practices potentially applicable to the collection, management, use, analysis & privacy of data; ethical issues.
Honors Big Data Praxis Lab
2016-2017

Readings:


Brainstorming on potential Spring semester Team Projects

Week 8: October 13—No Class - Fall Break
Week 9: October 20--- **Big Data and Law Enforcement**

**Topics:**

The benefits and dangers associated with using big data for crime prevention, interdiction and in the criminal justice system; predictive policing, data consolidation and sharing, identifying crime patterns and using big data for real-time situational threat assessment; the specter of “big brother” and mass surveillance; the loss of the human element in crime interdiction; data and sentencing.

**Readings:**

“How Predictive Policing Software Works,” The Verge (February 3, 2016) available at [https://www.youtube.com/watch?v=YxyyeaL7NEM](https://www.youtube.com/watch?v=YxyyeaL7NEM) (2:04 minutes)


Hector Chaidez, “Interactive Predictive Policing Program in South Pasadena, California,” (July 25, 2016) available at [https://www.youtube.com/watch?v=LqoFk0Y3XXg](https://www.youtube.com/watch?v=LqoFk0Y3XXg) (11:26 minutes)


Response to ProPublica article by developer of computer program available at [https://www.documentcloud.org/documents/2998391-ProPublica-Commentary-Final-070616.html](https://www.documentcloud.org/documents/2998391-ProPublica-Commentary-Final-070616.html)
Week 10: October 27 --- **Big Data and Education**

**Topics:**

Use of big data for admissions, retention, identifying students at risk, predicting success, course scheduling, student advising and delivery of courses. University use of outside vendors or data analytics; privacy and data security issues

**Readings:**


Jeffrey R. Young, “This Chart Shows the Promise and Limits of ‘Learning Analytics’”, The Chronicle of Higher Education (January 4, 2016) available at [http://chronicle.com/article/This-Chart-Shows-the-Promise/234573](http://chronicle.com/article/This-Chart-Shows-the-Promise/234573)
Week 11: November 3---**Big Data and Business**

**Topics:**
Understanding customer needs and how businesses are using machines to make decisions not only in marketing and retail sales, but also in making hiring and other human resources decisions; consent and privacy issues when businesses collect information about consumers.

**Readings:**


Review the Mirador company website at [https://www.miradortech.com/](https://www.miradortech.com/)

**Guest Presenter:**
Trevor Dryer, Founder and CEO, Mirador
Week 12: November 10—**Big Data and Healthcare**

**Topics:**

Precision medicine, electronic health records, privacy of medical information, aggregation and sharing of records, transparency, medical device wearables, improved efficiency, patient outcomes and reduction of costs.

**Readings:**


Dylan Scott, What Does the Mormon Church have to do With Biden’s Cancer Moonshot?” Statnews.com (February 26, 2016) available at [https://www.statnews.com/2016/02/26/biden-cancer-moonshot-utah/](https://www.statnews.com/2016/02/26/biden-cancer-moonshot-utah/)


Tiffany Trader, “This Hospital Computer Knows When Your Days Are Numbered,” hpcwire.com (September 25, 2015) available at [https://www.hpcwire.com/2015/09/25/this-hospital-computer-knows-when-your-days-are-numbered/](https://www.hpcwire.com/2015/09/25/this-hospital-computer-knows-when-your-days-are-numbered/)  (read article and view embedded video)

Guest presenters:
Willard H. Dere, MD, Director of the Program in Personalized Health and Co-Director of Center for Clinical and Translational Science at the University of Utah Health Care System.
Loren Larsen, Chief Technology Officer, HireVue

Week 13: November 17---Student Oral Presentations on Research Projects.

Week 14: November 24--- No Class-Thanksgiving holiday

Week 15: December 1--- Student Oral Presentation on Proposed Team Projects

Week 16: December 8---Final selection and Preliminary Planning on Team Projects
Discuss detailed description of team project(s) and determine milestones and assignments over the semester break.