Data and Society
Syllabus and Course Information

Spring 2016
Data and Society
CSCI 6370 (Grads) / 4370 (Undergrads)

• Professor: Dr. Fran Berman
• Office: AE 218
• Office Hours: Friday 1-2 or by appointment (send email to bermaf@rpi.edu)
• Course website: http://www.cs.rpi.edu/~bermaf/Data%20Course%202016.html
Data and Society
CSCI 6370 (Grads) / 4370 (Undergrads)

COURSE ELIGIBILITY
The course is open to graduate and undergraduate students in computer science and ITWS. Other majors will be considered by approval of the instructor as space allows.

COURSE DESCRIPTION
Data and Society focuses on how data is changing how we work and live. The course provides an overview of the data-driven world touching on big data, the Internet of Things, data rights and privacy, data and health, and other topics. Course meetings consist of lectures, student presentations and guest speakers. Guest speakers this semester include Dr. Phil Bourne, Associate Director for Data Science at the National Institutes of Health, and Professor Bulent Yener from RPI.

Data and Society is designed to help develop the sophisticated data literacy needed to navigate today's world. It is also a communication-intensive course. Assignments will help build writing, presentation, and critical thinking and assessment skills, all of which are important for professional success. Both graduates and undergraduates are welcome. For additional information, contact Professor Fran Berman at bermaf@rpi.edu.

Graded work for the course will focus on helping students develop critical communication and assessment skills needed for professional success. Students' grades will be based on two written reviews and oral presentations from class "data roundtables", two midterms, an op-ed, and class participation. For more information, please contact the instructor.
Syllabus

January 29: L1 -- Intro: The Data Ecosystem / Data Roundtable
February 12: L3 -- Data-driven Science / L2 Data Roundtable
February 19: L4 -- Future Infrastructure -- Internet of Things / L3 Data Roundtable
February 26: Section 1 Exam / L4 Data Roundtable
March 4: Paper assignment description / Section 1 Data Roundtable
March 11: L5 -- Data and Health -- Phil Bourne Guest Lecture / Section 2 Data Roundtable
March 18: Spring Break / no class
March 25: L6 -- Data and Entertainment / L5 Data Roundtable
April 1: L7 -- Big Data Applications / L6 Data Roundtable
April 8: L8 -- Data in the Global Landscape / L7 Data Roundtable
April 15: L9 -- Digital Rights / L8 Data Roundtable
April 22: L10 -- Data Security and Privacy -- Bulent Yener Guest Lecture / L9 Data Roundtable
April 29: L11 -- Digital Governance and Ethics / L10 Data Roundtable
May 6: Section 3 Exam / L11 Data Roundtable
<table>
<thead>
<tr>
<th>Section Theme</th>
<th>Date</th>
<th>First “half”</th>
<th>Second “half”</th>
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<tbody>
<tr>
<td>**Section 1: The Data Ecosystem</td>
<td>January 29</td>
<td>Class introduction; Digital data in the 21st Century (L1)</td>
<td>Data Roundtable / Fran</td>
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<tr>
<td>- Fundamentals</td>
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<td>February 5</td>
<td>Data Stewardship and Preservation (L2)</td>
<td>L1 Data Roundtable / 5 students</td>
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<tr>
<td>February 12</td>
<td>Data-driven Science (L3)</td>
<td>L2 Data Roundtable / 5 students</td>
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<tr>
<td>February 19</td>
<td>Future infrastructure – Internet of Things (L4)</td>
<td>L3 Data Roundtable / 5 students</td>
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<tr>
<td>February 26</td>
<td>Section 1 Exam</td>
<td>L4 Data Roundtable / 5 students</td>
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<tr>
<td>**Section 2: Data and Innovation</td>
<td>March 4</td>
<td>Paper assignment description</td>
<td>Section 1 Data Roundtable / 5 students</td>
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<tr>
<td>- How has data transformed science</td>
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<td>and society?</td>
<td>March 11</td>
<td>Data and Health: Phil Bourne guest lecture (L5)</td>
<td>Section 2 Data Roundtable / 5 students</td>
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<td>March 18</td>
<td>Spring Break / no class</td>
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<td>March 25</td>
<td>Data and Entertainment (L6)</td>
<td>L5 Data Roundtable / 5 students</td>
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<td>April 1</td>
<td>Big Data Applications (L7)</td>
<td>L6 Data Roundtable / 5 students</td>
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<tr>
<td>**Section 3: Data and Community</td>
<td>April 8</td>
<td>Data in the Global Landscape (L8)</td>
<td>L7 Data Roundtable / 5 students</td>
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<td>- Social infrastructure for a data</td>
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<td>Section 2 paper due</td>
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<td>driven world</td>
<td>April 15</td>
<td>Digital Rights (L9)</td>
<td>L8 Data Roundtable / 5 students</td>
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<td>April 22</td>
<td>Bulent Yener Guest Lecture, Data Security (L10)</td>
<td>L9 Data Roundtable / 5 students</td>
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<tr>
<td>April 29</td>
<td>Digital Governance and Ethics (L11)</td>
<td>L10 Data Roundtable / 5 students</td>
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<td>May 6</td>
<td>Section 3 Exam</td>
<td>L11 Data Roundtable / 5 students</td>
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Data and Society – about this course

• This course will provide a broad snapshot of the data-driven world
  – We’ll skim the sea of interesting data stuff, but we won’t / can’t include everything
  – We’ll focus more on societal issues than technical issues
  – The course should provide a complement to the material in the ITWS Data Science, Web Science, Data Analytics and other courses

• The course will be structured to
  – Increase your engagement with material
  – Evolve your professional communication and assessment skills
  – Help you develop as a “data-literate” professional

Course structure:
• Section 1: The Data Ecosystem – Fundamentals and infrastructure
• Section 2: Data and Innovation – How data has transformed science, commerce, and life
• Section 3: Data and Community – Social infrastructure for a data-driven world

Guest Speakers this Semester:
• Phil Bourne, NIH
• Bulent Yener, RPI CS Professor
Course Information
http://www.cs.rpi.edu/~bermaf/Data%20Course%202016/Data%20Course%202016-%202016.html

• Course website (above) will have all up-to-date information and materials.
  – Syllabus may evolve slightly

• Reference and Roundtable materials will be on the web
  – Embedded reference materials in the lecture will be given by URL.
    Lectures will be on the web.

• Reference and reading materials may be tested on the Section exams
How you’ll be graded

Student grades are computed from:

• **2 section exams** (20 points each)

• **1 section paper** (20 points):
  – Undergrads: 7 page research paper on an approved topic
  – Grads: 10 page research paper on an approved topic

• **Class participation** (10 points)

• **1 Op-Ed** (10 points, due before April 29)

• **2 Data Roundtable reviews / presentations** (roughly 1 per section, 10 points each)

_Time permitting, one “do-over” op-ed or data roundtable may be accepted. More information on whether that is possible will be provided after Section 1._
More about grading  
(additional grading specifics given in course lectures on website)

• **Data Roundtables:**
  – Students are responsible for scheduling their Data Roundtables and ensuring that both are done. Information about Data Roundtables will be given during Lecture 1.

• **Op-Eds, Papers:**
  – Information about Op-Eds will be given during Lecture 2. Information about the Paper Assignment will be given on March 4.

• **Class engagement / attendance:**
  – Students are expected to attend 14/15 out of the class meetings. Attendance will be taken in class.
  – Engagement grade: 5% attendance, 5% class participation

• **Exams** will be primarily in essay format. You’re responsible for anything covered in class and in the relevant readings.

• **There will be a slightly different workload for grad students and undergrads**
  – Section 2 paper lengths are different.
  – In writing and presentations, each student will be assessed at a level appropriate to their educational level (undergrad or grad)
## Learning Objectives and Outcomes

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<tr>
<th>Learning Objective</th>
<th>Outcome</th>
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<tr>
<td>Develop greater data literacy</td>
<td>Be able to understand and explain the role that data plays as well as its limitations in various areas of research, commerce and modern life.</td>
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<td>Develop critical thinking skills around data</td>
<td>Be able to read, understand, assess, and discuss data-oriented professional and popular publications and articles.</td>
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<tr>
<td>Develop communication skills around data</td>
<td>Be able to advance an evidence-based argument about data, data cyberinfrastructure and data-oriented efforts to both knowledgeable specialists within the field as well as non-specialists.</td>
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Academic Integrity

- Student-teacher relationships are built on trust. For example, students must trust that teachers have made appropriate decisions about the structure and content of the courses they teach, and teachers must trust that the assignments that students turn in are their own. Acts, which violate this trust, undermine the educational process. The Rensselaer Handbook of Student Rights and Responsibilities defines various forms of Academic Dishonesty and you should make yourself familiar with these.

- In this class, all assignments that are turned in for a grade must represent the student’s own work. In cases where help was received, or teamwork was allowed, a notation on the assignment should indicate your collaboration. If references or other materials are used, they should be cited. Submission of any assignment that is in violation of this policy will result in a penalty.

- If found in violation of the academic dishonesty policy, students may be subject to two types of penalties. The instructor administers an academic (grade) penalty, and the student may also enter the Institute judicial process and be subject to such additional sanctions as: warning, probation, suspension, expulsion, and alternative actions as defined in the current Handbook of Student Rights and Responsibilities. If you have any question concerning this policy before submitting an assignment, please ask for clarification.