New Jersey Institute of Technology

Digital Commons @ NJIT

Spring 2021

HSS 408-464: Robots and Work

Bernadette Logo

Follow this and additional works at: https://digitalcommons.njit.edu/hum-syllabi

Recommended Citation

HSS 408, Robots + Work
Dr. Bernadette Longo, Spring 2021

Section 462 & 464: online via Canvas (http://canvas.njit.edu)
Instructor Office: Cullimore Hall 419
Office Hours: Thursdays 3:00 - 4:00 on Webex (https://njit.webex.com/meet/blongo6077)
and via email at any time
Phone: 973-596-5384 or 973-596-3266 (Humanities office)
E-mail: blongo@njit.edu

Course Description: Humanities senior seminar. Combine current theory with practice to prepare students as socially conscious technology developers. Analyze complex social and technical situations to develop socially appropriate responses through tasks that involve problem analysis, ethical considerations, and technology issues regarding "influences on the distribution of jobs and nature of work. While advances promise to inject great value into the economy, they can also be the source of disruptions as new kinds of work are create and other types of work become less needed due to automation" (Partnership on AI).

Open questions we will explore include (from DeepMind Ethics & Society):

- How can we understand and estimate the effect AI will have on the changing labor market? What are the possible risks, benefits, and consequences of these changes?
- How and when will AI affect the relative earning power of different economic groups in society? What forms of inequality could this create or exacerbate?
- How can the social and economic impact of AI be anticipated and modelled, given that they are predicated on technological advances yet to be made?
- What new opportunities do these technologies create, and what responses are needed to ensure positive economic effects, inclusivity and equal access to benefits?
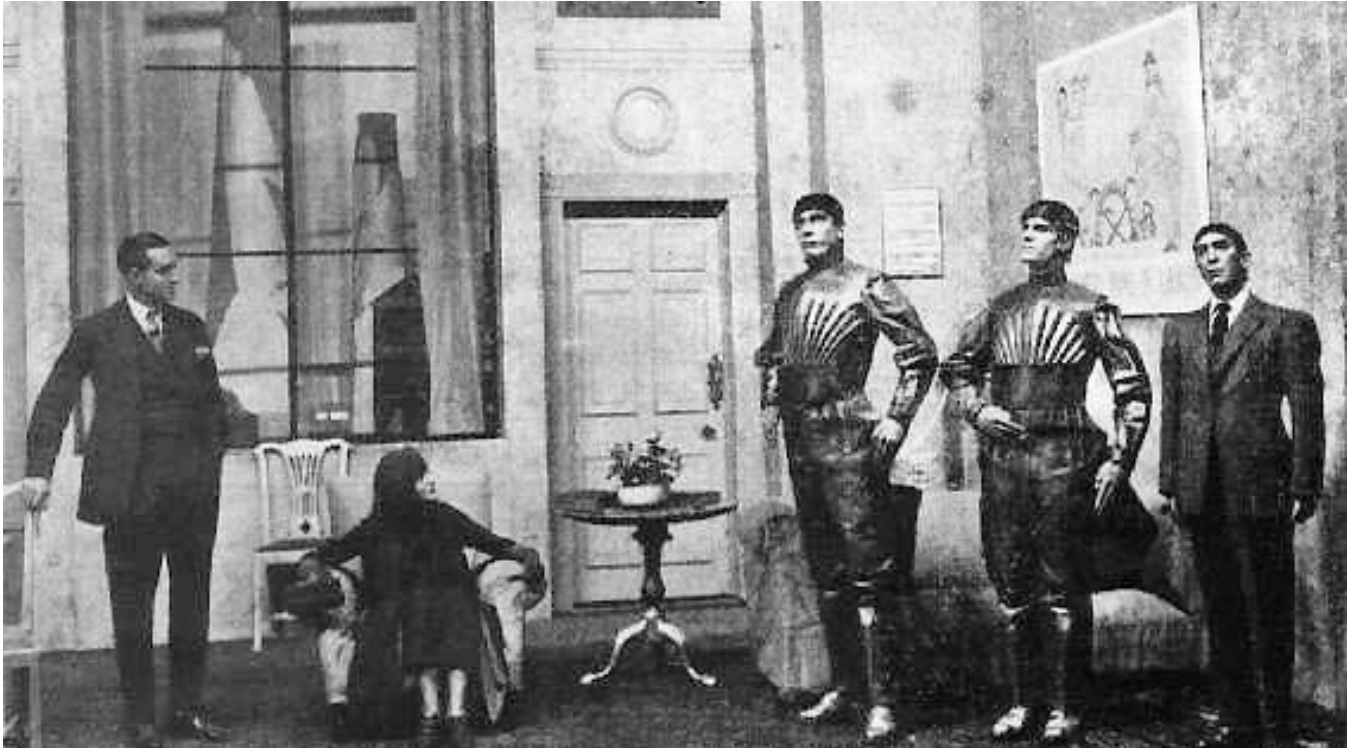

Learning Objectives
1. Be familiar with historical ideas relating to automation and impacts on labor markets. Be able to relate historical information with current and future trends in technology development and its social implications.
2. Be familiar with effects of automation and robotics on current labor markets and business practices. Analyze effects and apply them to future trends in technology development and its social implications.
3. Analyze and effects of trends in automation, robotics, and business practices on conditions of various economic groups in society. Apply analysis to specific cases and their social implications.
4. Analyze ethical issues relating to trends in automation, robotics, and business practices. Apply analysis to specific cases and their social implications.
5. Write effective prose that is professionally appropriate and mechanically correct.

Course Materials

- Kaplan, Jerry. *Humans Need Not Apply*. New Haven: Yale University Press, 2015.
- Posdorovkin, Maxim. *The Truth about Killer Robots*. Streaming movie available at this link.
- Ross, Alec. *The Industries of the Future*. NY: Simon & Schuster, 2016.
- Schwab, Klaus. *The Fourth Industrial Revolution*. NY: Crown Business, 2016.
- West, Darrell M. *The Future of Work: Robots, AI, and Automation*. Washington, D.C.: Brookings Institute Press, 2018.

Additional resources available on course site.

- Generation Robot. Mouser Electronics. Five-part series of short videos.
- AI Now 2016-2019 Symposia at NYU.
- Rossum's Universal Robots (R.U.R.) audiobook at this link. This 1920 science fiction play introduced the term "robot" into our lexicon. This play by Czech writer Karel Capek also sets out an archetypal plot for human-machine relations that continues to impact and reflect our relations with intelligent machines. The language in this play may seem dated, but it's worth listening to this early dramatization of a foundational plot.

http://ustheater.blogspot.com/2011/09/to-read-karel-capeks-drama-r.html

Academic Integrity: "Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: *http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf*. Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. ***Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or***

dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at *dos@njit.edu*"

Students with disabilities: Appropriate accommodations will be made for all students with documented disabilities. If you have a disability requiring accommodation in this class, please notify me as soon as possible. This information will be kept confidential. For more information, see https://www.njit.edu/studentsuccess/accessibility.

Grading: Your assignment grades will be given in points. Ten percent of the maximum assignment grade will be deducted each day that an assignment is not posted after an assignment deadline. The maximum number of points possible in the course is 1000. Your final course grades will be assigned according to the following scale:

Grade	Final Percentage	Significance
A	90.1-100	Superior
B+	86.7-90.0	Excellent
B	80.1-86.6	Very Good
C+	76.7-80.0	Good
C	70.1-76.6	Acceptable
D	60.1-70.0	Minimum
F	00.0-60.0	Inadequate

Incomplete coursework is a major inconvenience for students and instructors. I expect you to do everything in your power to avoid this situation. Legitimate excuses include verified illnesses and family emergencies. No incompletes will be given unless you have a prior written agreement with me. If you have questions about the NJIT grading policy, please click here. If you have questions about your responsibilities for course requirements, please click here.

Assignments

Week 1A + 1B ....40 pts.
Week 2 ....45 pts.
Week 3 ....50 pts.
Week 4..50 pts.
Week 5 ....50 pts.
Week 6 ....55 pts.
Week 7 ....50 pts.
Week 8 ....100 pts.
Week 10A + 10B..80 pts.
Week 11 ....50 pts.
Week 12 ....70 pts.
Week 13 ....30 pts.
Week 14 ....200 pts.
Week 15 ....130 pts.

Total points possible   1000 points

HSS 408 Class Activities

Week 1: January 19-24
Topic: Impacts of Automation on Employment
Reading:

- Campa, Riccardo. "Chapter 1: Engineers and Automata." *Humans and Automata: A Social Study of Robotics*. Frankfurt am Main: Peter Lang, 2015. Pages 23-36.
- National Council on Compensation Insurance. "The Impact of Automation on Employment – Part I." Online at this link and in resource folder on course site.
- Posdorovkin, Maxim. *The Truth about Killer Robots*. Streaming movie available at this link.
- Schwab, Klaus. "Introduction and Chapter 1." *The Fourth Industrial Revolution*. Pages 1-13.
- Semuels, Alana. "Millions of Americans Have Lost Their Jobs in the Pandemic…" Time, August 7, 2020. Online at this link and in resource folder on course site.

Assignment 1: post by **Sunday, January 24** at midnight

- **1A: Post an introduction of yourself** for the others in class to get to know you. Use your creativity regarding media and types of documents you use in your introduction. Answer the following questions and add what you will:
  - Your name and major
  - Your goals for work in this senior seminar
- **1B: Post your initial thoughts** on one of these open questions from DeepMind that we will be exploring this semester. Include ideas from this week's resources in your response.
  - How can we understand and estimate the effect AI will have on the changing labor market? What are the possible risks, benefits, and consequences of these changes?
  - How and when will AI affect the relative earning power of different economic groups in society? What forms of inequality could this create or exacerbate?
  - How can the social and economic impact of AI be anticipated and modelled, given that they are predicated on technological advances yet to be made?
  - What new opportunities do these technologies create, and what responses are needed to ensure positive economic effects, inclusivity and equal access to benefits?

Week 2: January 25-31
Topic: Impacts of Automation on Society
Reading:

- Daron Acemoglu. "Robotics, AI, and the Future of Work." June 22, 2018. Video lecture at this link.
- George A. Bekey. "Current Trends in Robotics: Technology and Ethics." *Robot Ethics: The Ethical and Social Implications of Robotics*. Eds. Patrick Lin, Keith Abney, George A. Bekey. Cambridge, MA: The MIT Press. 2012. Pages 17-34.
- Lin, Patrick. "Introduction to Robot Ethics." *Robot Ethics: The Ethical and Social Implications of Robotics*. Eds. Patrick Lin, Keith Abney, George A. Bekey. Cambridge, MA: The MIT Press. 2012. Pages 1-16.
- Schwab, Klaus. "Chapter 3.4: Society" and "3.5 The Individual" *The Fourth Industrial Revolution*. Pages 91-105.

- **Optional reading:** Longo, Bernadette. "Human+Machine Culture: Where We Work." *Digital Literacy for Technical Communication: 21st Century Theory and Practice.* 2009, pp. 147-168.

Assignment 2: post by **Sunday, January 31** at midnight

- Post your responses to these questions:
    - 2.1 Are some jobs too important, or too dangerous, for machines to take over?
    - 2.2 What ethical implications do you see in this statement from the Bekey reading: "It is evident that shared, cooperative work between humans and robots may enhance the working environment, but it may also reduce human-human interaction and communication."
    - 2.3 How do you respond to this statement from the Schwab reading: "When one's life becomes fully transparent and when indiscretions big or small become knowable to all, who will have the courage to assume top leadership responsibilities?"

Week 3: February 1-7
Topic: Changing Labor Market
Reading:

- Daron Acemoglu. "Why We Need to Think of AI as a Platform." May 22, 2019. Video available at this link.
- Casselman, Ben. "Robots? Training? Factories Tackle the Productivity Puzzle." New York Times, June 25, 2018. Online at this link and posted on Canvas course site.
- McKinsey Global Institute. "What is the future of work?" December 2017. Podcast and transcript online at this link.
- Ross, Alec. "Introduction" and "Chapter 1: Here Come the Robots." *The Industries of the Future*. NY: Simon & Schuster. Pages 1-43.
- **Optional reading:** David Autor and Elisabeth Reynolds. "The Nature of Work after the COVID Crisis: Too Few Low Wage Jobs." July 2020. The Brookings Institute. Online at this link and in the Resource Folder.

Assignment 3: post by Sunday, February 7 at midnight

- Post your response to this Open Question 1:
    - o How can we understand and estimate the effect AI will have on the changing labor market? What are the possible risks, benefits, and consequences of these changes?

Week 4: February 8-14
Topic: Economies Around the World
Reading:

- Ross, Alec. "Chapter 6: The Geography of Future Markets" and "Conclusion: The Most Important Job You Will Ever Have." *The Industries of the Future*. NY: Simon & Schuster. Pages 186-249.
- Kai-Fu Lee. "Time 100 Talks with Kai-Fu Lee." June 17, 2020. Video available at this link.
- United Nations International Telecommunications Union. "AI for Good: Global Summit 2020." In Resource Folder and online at this link.

Assignment 4: post by **Sunday, February 14** at midnight

- Post your response to this statement from the Ross reading:

- "The growing economic diversity and increasing pace of change means that investors and people in global business will have to be as mobile and able to work across cultures as people newly entering the workforce.

Week 5: February 15-21
Topic: Earning Power of Economic Groups
Reading:
- MIT Work of the Future Task Force. "The Work of the Future: Building Better Jobs in an Age of Intelligent Machines." November 17, 2020. Pages 7-28. Available in Resource Folder and at this link.
- Daron Acemoglu. "Does Automation Lead to New Industries?"January 29, 2019. Video at this link.
- McKinsey Global Institute. "How will automation affect jobs, skills, and wages?" March 2018. Podcast and transcript online at this link.
- McKinsey Global Institute. "Jobs Lost, jobs gained: What the future of work will mean for jobs, skills, and wages." December 2017. Article and full report available online at this link.

Assignment 5: post by **Sunday, February 21** at midnight
- Post your response to this Open Question 2:
  - How and when will AI affect the relative earning power of different economic groups in society? What forms of inequality could this create or exacerbate?

Week 6: February 22-28
Topic: Anticipating Economic Impacts
Reading:
- Lee, Kristin. "Artificial Intelligence, Automation, and the Economy." The White House, December 20, 2016. Online at this link. Full report posted on course site.
- Wladawsky-Berger, Irving. "AI, Automation, and the U.S. Economy." *MIT IDE*, January 16, 2017. Online at this link and on course site.

Assignment 6: post by **Sunday, February 28** at midnight
- Post your response to this question:
  - On page 3 of the December 20, 2016 White House report, the authors say, "Technology is not destiny; economic incentives and public policy can play a significant role in shaping the direction and effects of technological change. Given appropriate attention and the right policy and institutional responses, advanced automation can be compatible with productivity, high levels of employment, and more broadly shared prosperity." They then present three policy strategies for anticipating economic impacts of AI. What are your reactions to these policy statements?

Week 7: March 1-7
Topic: Modeling the Future
Reading:

- MIT Work of the Future Task Force. "The Work of the Future: Building Better Jobs in an Age of Intelligent Machines." November 17, 2020. Pages 49-68. Available in Resource Folder and at this link.
- PWC. "The macroeconomic impact of artificial intelligence**."** Online at this link. Full report posted on course site.
- Duke SciPol. "Artificial Intelligence, Automation, and the Economy." Online at this link. Full report posted on course site.
- Craig Le Clair. "Invisible Robots in the Quiet of the Night." 2019. Videos available at this link and this link. Book available at this link.

Assignment 7: post by **Sunday, March 7** at midnight

- Post your response to this Open Question 3:
    - How can the social and economic impact of AI be anticipated and modelled, given that they are predicated on technological advances yet to be made?

Week 8: March 8 - 14
Topic: Position Paper Midterm
Reading:

- Model UN "Position Papers." Sample papers online at this link. Information also in Resource Folder.
- Lukas Wolters. "Robots, Automation, and Employment: Where We Are." May 26, 2020. See especially section 4 of this paper. Online at this link and in Resource Folder.

Assignment 8: post by **Sunday, March 14** at midnight

Using the readings in Weeks 1-7, write a position paper on what you've learned about the topic of Robots + Work so far this semester. Structure your paper around these open questions (from DeepMind Ethics & Society):

- How can we understand and estimate the effect AI will have on the changing labor market? What are the possible risks, benefits, and consequences of these changes?
- How and when will AI affect the relative earning power of different economic groups in society? What forms of inequality could this create or exacerbate?
- How can the social and economic impact of AI be anticipated and modelled, given that they are predicated on technological advances yet to be made?

Your audience will be Dr. Longo and the other students in class this semester. Your purpose is to demonstrate what you have learned about the topic and how you can apply your knowledge outside the classroom to society-at-large as a technology professional.

Week 9: March 15-21
Enjoy the Spring Break!

Week 10: March 22-28
Topic: Social Responsibility and Collaborative Writing
Reading:

- Your partner's Week 8 position paper.
- Singer, Natasha. "Tech's Ethical 'Dark Side": Harvard, Stanford, and Others Want to Address It." New York Times, February 12, 2018. Online at this link and posted on course site.

Assignment 10: post by **Sunday, March 28** at midnight

- As a team, complete the following and turn in 1 assignment for your team:
  9A: Read each other's position paper and write a comparison of each of your positions on Open Questions 1-3. How might you reconcile your positions into a team position on these questions?
  9B: Write your team's reaction to this statement from this week's reading: "Technology is not neutral," said Professor Sahami, who formerly worked at Google as a senior research scientist. "The choices that get made in building technology then have social ramifications.

Week 11: March 29-April 4
Topic: Opportunities and Responses

- Kaplan, Jerry. "Chapter 8: Take This Job and Automate It," "Chapter 9: The Fix Is In," and "Outroduction: Welcome to Your Children's Future." *Humans Need Not Apply*. New Haven: Yale University Press, 2015. Pages 129-208.
- Schwab, Klaus. "A Better Economy Is Possible…" *Time Magazine*, October 22, 2020. Online at this link and in resource folder on course site.

Assignment 11: post by **Sunday, April 4** at midnight

- As a team, post your response to this Open Question 4:
- What new opportunities do these technologies create, and what responses are needed to ensure positive economic effects, inclusivity and equal access to benefits?

Week 12: April 5-11
Topic: Opportunities and Responses Position Paper
Reading:

- West, Darrell M. "Chapter 4: Rethinking Work," "Chapter 5: A New Social Contract," and "Chapter 6: Lifetime Learning." *The Future of Work: Robots, AI, and Automation*. Washington, D.C.: Brookings Institute Press, 2018. Pages 63-124.
- Model UN "Position Papers." Sample papers online at this link. Information also in Resource Folder.

Assignment 12: post by **Sunday, April 11** at midnight

- Post your team's position paper on Open Question 4:
  - What new opportunities do these technologies create, and what responses are needed to ensure positive economic effects, inclusivity and equal access to benefits?

Week 13: April 12-18

Topic: Position Paper Draft

Reading:

- Model UN "Position Papers." Sample papers online at this link. Information also in Resource Folder.

Assignment 13: post by **Sunday, April 18** at midnight

- As a team and using the readings in Weeks 1-11, post a draft position paper on what your team has learned about the topic of Robots + Work this semester. Structure your paper around these open questions (from DeepMind Ethics & Society):
  - How can we understand and estimate the effect AI will have on the changing labor market? What are the possible risks, benefits, and consequences of these changes?
  - How and when will AI affect the relative earning power of different economic groups in society? What forms of inequality could this create or exacerbate?
  - How can the social and economic impact of AI be anticipated and modelled, given that they are predicated on technological advances yet to be made?
  - What new opportunities do these technologies create, and what responses are needed to ensure positive economic effects, inclusivity and equal access to benefits?

  Your audience will be the people working at AI Now Institute at New York University, Dr. Longo, and the other students in class this semester. Your purpose is to persuasively advocate for your team's position based on what you have learned about the topic. The point of this assignment is to practice applying your knowledge as a technology professional to technology+society issues outside the classroom.

Week 14: April 19-25

Topic: Position Paper

Assignment 14: post by **Sunday, April 25** at midnight

- As a team, revise your position paper into a final version.

Week 15: April 26-May 2

Topic: Final Analysis of Robots+Work

Assignment 15: post by **Sunday, May 2** at midnight

- As an individual, post an analysis of the course topic "Robots+Work" covering the following six points:
  1. What is your historical understanding of how robots have been incorporated into workplaces? Why is this understanding important for your position on the course topic?
  2. What is your understanding of the current situation regarding robots in workplaces? How did you come to this understanding? Why is this understanding important for your position on the course topic?
  3. What is your understanding of ethical questions regarding robots in workplaces? How did you come to this understanding? Why is this understanding important for your position on the course topic?

4. What is your understanding of social implications regarding robots in workplaces? How did you come to this understanding? Why is this understanding important for your position on the course topic?
5. What is your understanding of your social responsibility as a technology professional regarding robots in workplaces? How did you come to this understanding? Why is this understanding important for your career? Why is this understanding important for society-at-large?
6. What is the main thing you learned this semester about Robots+Work? Why is this important and how might you use this experience in the future?

This syllabus and the due date schedule may be revised by the instructor at any time during the semester. All revisions will be reasonable and based on class needs.