Future of Labor

Prof. Yong Suk Lee
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Course meets 2X per week (75-minute class periods)

Course Description
The new wave of technologies, e.g., robotics and AI will have long-lasting impacts on the labor market. Jobs will be displaced, new tasks will be created, different skills will be demanded, and new management practices will emerge. These new technologies may benefit workers unevenly, potentially increasing inequality. At the same time, new demographic challenges driven by aging will have large impacts on labor. How will these forces affect the future of labor and how should we prepare for changes in the labor market?

The goal of this course is to provide students with a framework for analyzing how new technologies like robotics and AI will affect the labor market drawing largely from the economics literature. Students will analyze and describe the literature on these topics and understand the different methodologies used in the literature. Ultimately, students will build perspectives on how AI and robotics could affect jobs, occupations, the future of work, income distribution and social institutions. Students will also build perspectives on education, training, and redistribution policies that can help mitigate the labor market disruptions created by technological change. Students will collect and analyze data that can provide insights on the future of labor.

Prerequisites
The first-year statistics/econometrics sequence should suffice for MGA students. For Economics students Econometrics is a prerequisite. For other students, similar courses in other departments that cover linear regression may substitute as prerequisites. I will review regression concepts, but I expect students to have a basic understanding of regression analysis.

Course Requirements and Evaluation
Grades will be determined by the following formula. You must complete all assignments by the due date to get a passing grade, i.e., you may not strategically choose to skip an assignment.

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<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Class participation</td>
<td>15%</td>
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<tr>
<td>Response papers (2)</td>
<td>16%</td>
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<tr>
<td>Data analysis and short report (1)</td>
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<td>Final project</td>
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<tr>
<td>-Proposal</td>
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<td>-Initial draft</td>
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<td>-Presentation</td>
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<td>-Final Short Paper</td>
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**Class participation:** Students are expected to attend class every day and participate in discussions. This part of your grade will be determined by your engagement with the course material and your peers, including attendance, reading of the assigned material before class, and constructive contributions. Class attendance is mandatory. If you have to miss class you must inform me ahead of time to be excused. Unexcused absence will negatively affect your class participation points. More than 3 unexcused absences will result in a zero for your participation grade. Again, if you need to miss class due to an extenuating circumstance, email me before class to let me know. Everyone is expected to present during the mini-conference, the two classes when students present their research.

**Response papers:** Students will complete two short reading response papers of about two double-spaced pages, each reflecting on assigned readings for the upcoming class. You may choose any date that fits your interest and schedule, as long as one is written for a class before Spring break and the other for a class after Spring break. Response papers are due by submission to Canvas under “Assignments” by 10:00 a.m. the day of the relevant class. You will sign up for the dates of your two responses in a survey I will circulate after the first week. These reading responses should:

1. *Briefly summarize* the major points/ideas/concerns of the readings for the day (no more than a paragraph),
2. Draw connections to other course materials, apply the ideas raised in the readings to real-world applications of interest to you, or unpack any arguments that you found stimulating or challenging, AND
3. Conclude with two discussion questions for the class.

**Data analysis and report:** There will be an assignment where you will analyze data and write a brief report related to the future of labor. These are datasets that were used in papers that we cover in the earlier parts of the course. I will provide a couple of data sets and you can choose one to examine. Students will write a short report, between 800 and 1,000 words, on how the data were collected, the descriptive patterns you examined using the dataset, any limitations of this dataset, and suggestions for improvement. Information about the datasets and assignment will be distributed in the third week of class.

**Research Paper**

**Individual or group project:** A substantial portion of the course will be the research project. You can do the research project on your own or as a group of 2 to 3 people. If you do want to do a group project, you can form your own groups and let me know. Otherwise, I will form groups based on the topics the students are interested in.

**Research Project**

The hallmark of the course is your research project. Students will work in groups of 2 to 3 people. The research project involves writing a short proposal, giving a short class presentation, and writing a final paper on a specific topic related to labor. The paper must have an empirical component, i.e., some empirical evidence and/or data analysis that can back up your main
arguments. I will offer a few datasets which you can choose from but feel free to choose your own research question and dataset.

**Initial idea submission:** Early on in the semester, individual students or groups (if doing a group project) should get together to discuss potential research topics. Ideally, having conducted some preliminary research, each individual/group should converge on one or two (or three at most) research questions. You will share the potential research questions with me and I will provide feedback so that you may decide which one would be most appropriate and feasible for the class.

**Proposal:** The main goal of the research proposal is to come up with an interesting research question. Finding a question interesting to you and convincing others that the question is interesting is the first step towards good research, and is quite difficult. You will need to search for articles, review the literature, and refine the question many times. I encourage each of you to think about a question as early on as possible in the course. I will distribute a guideline on how to write the research proposal.

**Initial draft:** The main goal of the initial draft is to put you on track to produce a strong research paper. At this point you should have worked on the empirical analysis and have decided on the key findings and narrative of your research paper. The initial draft should coherently explain your motivation research, research question, literature, and present some empirical analysis. This draft can actually be longer than the final draft. At the minimum you should aim for about 60 to 70% of the final word count.

**Presentation (Mini-conference):** There will be an in class mini-conference where you will present your research. The presentations will be around 15 minutes and will form the basis of your final paper. I will provide guidelines on the structure of the presentation. *How well and clearly you convey your findings, as well as, how well you provide constructive feedback to someone else’s presentation will be important.*

**Final Paper:** The final short paper is a write-up of your research that closely follows the outline of your presentation. It should be less than 2,000 words (main text excluding reference), with a maximum of five exhibits (figures or tables).

**Late policy**
All assignments must be submitted on time. Late work will be penalized by 15% each day. To be fair to all students, work submitted more than 2 days late will not be accepted. I may grant extensions to students who face extenuating circumstances, such as health or family emergencies. When those situations come up, I ask that you please get in touch with me as soon as possible.
Course Policies

**Mutual respect and privacy:** In this course, we will encounter a variety important debates pertaining to the use and impacts of technologies. Some may touch on contentious subjects and/or spotlight harms that may be especially concentrated within certain communities. I expect students to engage with each other’s perspectives respectfully and constructively. I hope that discussions will be rigorous, but also ask that we work together to build an inclusive classroom environment.

In the interest of creating a comfortable environment for sharing questions, ideas, and experiences in class discussions, I also ask that you not make any digital recordings (audio, photographic, or video) of others without their consent during class time. I also request that you please check in with me before sharing any course materials with others outside of this class.

**Classroom behavior:** Coming late to class or leaving the class during the lectures will disturb the instructor and all your fellow classmates. Please be on time and be respectful for everyone.

**Digital Device:** Do not bring laptops to class, and you must silence your phones or other devices.

**Covid-19 accommodations and policies:** The Covid-19 pandemic has presented challenges and disruptions for many. If you are experiencing any issues — be it physical, mental/emotional, or personal — that interfere with your ability to participate fully in this class, please get in touch with me. I will work with you to figure out a plan to help you succeed in this course. In regards to masking and Covid related policies, we will follow university guidelines. However, you should feel comfortable to wear masks if you prefer to or wish to take additional precaution for each other and the community.

**Honesty & intellectual integrity:** Notre Dame students are expected to abide by the Academic Code of Honor Pledge. The Pledge and student guide are available at: http://honorcode.nd.edu. It is the University’s expectation that students be aware of and meet the expectations expressed in this policy. Please reach out to me if you have questions about how the Honor Pledge pertains to assigned work or required elements for this course.

**Disability and accommodation:** It is the policy and practice of The University of Notre Dame to provide reasonable accommodations for students with properly documented disabilities. Students who have questions about Sara Bea Accessibility Services or who have, or think they may have, a disability are invited to contact Sara Bea Accessibility Services for a confidential discussion in the Sara Bea Center or by phone at 574-631-7157. Because the University’s Academic Accommodations Processes generally require students to request accommodations in advance of the dates when they are needed, students who believe they may need an accommodation for this course are encouraged to contact Sara Bea Accessibility Services at their earliest opportunity. Additional information about Sara Bea Accessibility Services and the process for requesting accommodations can be found at supportandcare.nd.edu/.
# Course Schedule Outline

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<td>Course Introduction</td>
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<td>2</td>
<td>Declining Labor Share</td>
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<td>3</td>
<td>Rising Inequality</td>
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<td>4</td>
<td>Will New Technologies Erode Labor? Historical perspective</td>
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<td>5</td>
<td>Econometrics Review</td>
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<td>6</td>
<td>The Impact of Robots on Jobs</td>
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<td>7</td>
<td>Evolving and Varied Impact of Robots on Jobs</td>
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<td>8</td>
<td>Automation, Tasks, and Labor: Theoretical considerations</td>
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<td>9</td>
<td>Machine learning primer. (Online class)</td>
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<td>10</td>
<td>Predicting the Impact of AI/ML on jobs 1</td>
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<td>11</td>
<td>Predicting the Impact of AI/ML on jobs 2</td>
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<td>AI in Healthcare</td>
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<td>AI in Finance</td>
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<td>14</td>
<td>Algorithms and Human Decision</td>
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<td>15</td>
<td>Roundtable - proposal</td>
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### Midterm Break

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<tr>
<td>16</td>
<td>Management and Algorithms</td>
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<td>17</td>
<td>Entrepreneurship and the Direction of Innovation</td>
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<td>18</td>
<td>New Work</td>
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<td>19</td>
<td>Future Skills: which skills we be in demand?</td>
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<td>20</td>
<td>Demographic Change and Aging</td>
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<td>21</td>
<td>The post-Covid Era: a new era of work?</td>
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### Easter Holiday

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<td>22</td>
<td>Climate Change and the Future of Labor</td>
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<td>23</td>
<td>Project meetings</td>
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<td>24</td>
<td>Project meetings</td>
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<td>25</td>
<td>UBI, Meaning of Work and Happiness</td>
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<td>26</td>
<td>Student presentation</td>
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<td>27</td>
<td>Student presentation</td>
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<td>28</td>
<td>Wrap-up class</td>
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Course Schedule and Reading List

You do not need to purchase any books for this class. All readings have links in this syllabus. Please note that I reserve the right to adjust the course materials as the course progresses. I may tweak readings depending on the pace at which we are making our way through materials or to better align the topics we cover with the interests of the class. I will always give you a notice ahead of any changes.

PART 1. BACKGROUND

Class 1: Course Introduction

Class 2: Declining labor share

- Understanding the downward trend in labor income shares. IMF World Economic Outlook, April 2017. Chapter 3.

Supplementary:

Class 3: Rising inequality

- World Inequality Report 2022 and World Inequality Database
- Rising inequality affecting more than two-thirds of globe. UN News. January 21, 2020

Class 4: Will new technology erode labor?

Supplementary


Class 5: Econometrics review

- Whiteboard lecture
- If you feel rusty, review your econometrics notes/textbook or online review notes like this [one](#) or this [one](#).

PART 2. ROBOTS AND LABOR

Class 6: The impact of robots on jobs


Class 7: Evolving and varied impact of robots and jobs


Supplementary


Class 8: Automation, Tasks, and Labor: Theoretical considerations

PART 3. AI AND LABOR

Class 9: Machine learning primer. (Virtual Class)

- Machine Learning a Primer by Lizzie Turner (Medium)  
  https://medium.com/@lizziedotdev/lets-talk-about-machine-learning-ddca914e9dd1
  https://www.aeaweb.org/articles?id=10.1257/jep.31.2.87

Supplementary


Class 10: Predicting the impact of AI/ML on jobs

- O*NET Resource Center.

Supplementary


Class 11: Predicting the impact of AI/ML on jobs

- Carbonero, Francesco & Davies, Jeremy & Ernst, Ekkehard & Fossen, Frank M. & Samaan, Daniel & Sorgner, Alina, 2021. "The Impact of Artificial Intelligence on Labor Markets in Developing Countries: A New Method with an Illustration for Lao PDR and
https://docs.iza.org/dp14944.pdf


Supplementary

Class 12: AI and Labor in Health Care
- Ziad et al. Dissecting racial bias in an algorithm used to manage the health of populations https://www.science.org/doi/full/10.1126/science.aax2342

Supplementary

Class 13: AI and Labor in Finance
- The Bank of the Future: The ABCs of Digital Disruption in Finance. Chapter A. Citi GPS. https://ir.citi.com/CiDxU7p7pAitTmqzfMC9%2F911S21vJjXbn3wjpSEYiTXJ8FvEP_RWx8WmmrKNgBSzDi8E2mGOl%3D

Supplementary

Class 14: Algorithms and Human Decision – Criminal Justice
• “Machine Bias” by Julia Angwin, Jeff Larson, Surya Mattu and Lauren Kirchner (ProPublica, 2016)

Supplementary
• This is how AI bias really happens and why it’s so hard to fix (MIT Technology Review, 2019) https://www.technologyreview.com/2019/02/04/137602/this-is-how-ai-bias-really-happensand-why-its-so-hard-to-fix/

Class 15: Roundtable discussion
• Roundtable discussion on research proposal

MIDTERM BREAK

PART 4. MANAGEMENT, ENTREPRENEURSHIP, WORK AND SKILLS

Class 16: Management and Algorithms
• Nick Bloom and John Van Reenen. 2018. Measuring and Explaining Management Practices Across Firms and Countries. Quarterly Journal of Economics. https://drive.google.com/file/d/1m0o_7PZU9t3lEFcu7D3t3bylvp7TymDmJ/view

Supplementary
• NPR. Amazon warehouse workers in Alabama vote for second time in union effort. https://www.npr.org/2022/02/04/1077089349/amazon-union-vote-alabama

Class 17: Entrepreneurship and Innovation

Supplementary
• Retterath, Andre and Braun, Reiner, Benchmarking Venture Capital Databases (September 17, 2020). Available at http://dx.doi.org/10.2139/ssrn.3706108

Class 18: New work
Class 19: Future skills: Which skills will be in demand?

Supplementary

PART 5. MACRO-LEVEL CHANGES AND THE FUTURE OF LABOR

Class 20: Demographic Change and Aging

Supplementary

Class 21: The Post-Covid Era: Has the willingness to work changed?

Supplementary
• “The Big Quit”. https://hub.jhu.edu/2021/12/17/christina-depasquale-great-resignation/

Class 22: Climate Change and the Future of Labor


Class 23: Project meetings to discuss research paper and presentations

Class 24: Project meetings to discuss research paper and presentations

Class 25: Universal Basic Income, Meaning of Work and Happiness


Supplementary


• This is our chance to completely redefine the meaning of work. World Economic Forum. https://www.weforum.org/agenda/2019/01/this-is-our-chance-to-redefine-the-meaning-of-work/


Class 26: Student Presentations

Class 27: Student Presentations

Class 28: Wrap-up – Reflection and Perspectives


• Forum: AI’s Future Doesn’t Have to Be Dystopian and Response articles https://www.bostonreview.net/forum/ais-future-doesnt-have-to-be-dystopian/

• “The American Corporation is in Crisis—Let's Rethink It” by Lenore Palladino (Boston Review, 2019) and response. https://bostonreview.net/forum_response/isabelle-ferreras-shareholders-versus-stakeholders/