BUAN/ECO/MNGT Topics: Mind, Markets, and Technology

Bill Foote – Spring 2025

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Course Description

This course confronts technology's role in human society from three points of view: the economics of AI hindsight, insight, and foresight systems; the foundations of AI computational platforms in the logic and algebra of George Boole with Google Brain's Generative Pre-trained Transformers (built by the class); and the linkage of mind, body, and tools for ethics of technology, with the exemplary case of Artificial Intelligence (AI).

Some initial questions to ponder

Can an AI system think and be conscious of their thinking? If so, do AI-assisted/run markets and decision-making platforms think and are conscious? Does consciousness even matter, ultimately, to markets, to technology, to the common good? Is humanity just a brain inside an organic machine so that the mind stands to the brain as a software stands to hardware? How can creatures like ourselves think thoughts that are "about" things and reason about our reasoning (and doing, making)? How does our enchantment with technology save us? Is AI really going to be able to replace human intelligence? Should we want this? Why do we need $500 billion up front and lots of power and energy (physical and political) to underwrite such pervasive technology?

Pre-requisites

The minimal requirements as you walk into this course include these.

- A willingness to reflect on, question, and participate in substantive discussions about alternative, and sometimes competing, views about our minds, bodies, society, the decisions we make, the tools we use, include the technology of economics, growth, progress, decline, power and authority.
- Professional writing standards, including, bibiographic, organizational, use of English grammar, syntax, semantics. Imagine that your essays will be published in your favorite media outlet and you do not want the editor to reject your fine work for anything but content purposes.
- 5th grade arithmetic and some 9th grade algebra and how to use a pencil and paper (or their equivalents) to write and figure out the little bit of arithmetic and algebra we will do to understand AI and its deeper innards. We will be build a simple Generative Pre-Trained Transformer in your notebook (and in a spreadsheet).

Format and Assessment

The course will be conducted online and asynchronously with respect to lectures and assignments, along with opportunities to check in frequently in live sessions. Five 1,000 word essays (70%), a final essay (20%), and participation in class discussion boards (10%) are required.

The class will be run in a tutorial style (see Gilbert Highet, The Art of Teaching, p. 121). This means at the least each student, or team of students, meets regularly with the instructor and together collaborates on the architecture of the emphasis, frameworks, content, and exposition of each essay. By emphasis is meant here to mean the economics, data analytical, and philosophical perspectives, or, in some cases two of the three, or all three. The combinations boggle the mind.

Each essay will attend to literal (phenomenological, experiential), allegorical (normative, reasonable), tropical (moral, responsible), anagogical (what is most important to us, the good we seek) considerations. All considerations must tie back to the literal. We are not here to conform reality to our vagaries and animadversions. Or are we? This instructor would dearly love that debate!

In the millenia-old tradition, the teacher is a (kind, generous, but firm and persistent) goad to push the seemingly timid into action, and the overtly enthusiastic into focus. Our work together follows the ages old exhortation to encourage one another daily, while it is still today. Encouragement here is to "irrigate the deserts" in each of us and do so together, "not to cut down the jungles" (C.S. Lewis, The Abolition of Man, p. 9).

Grading Rubric for 1000 word essays

- 0 &– not submitted \
- 1-4 &– incomplete essay (much less than 1,000 words, e.g., 700 words *might* indicate this condition; however, succinctness is still a virtue). No evidence of comprehension of reading materials, only restates a few facts.
- 5-6 – shows some evidence of comprehending and reflecting on the reading materials, but thesis not clearly stated upfront.
- 7-8 - shows strong evidence of comprehending and reflecting on the reading materials, and thesis clearly stated upfront. They may show some degree of originality in their thesis, or opinions.
- 9-10 – shows strong evidence of comprehending and reflecting on the reading materials, and thesis is clearly stated upfront. The essay contains a high degree of originality, well-expressed opinions, and shows a clear, well-read understanding and mastery of the topic.

Essay effort guidelines

[points out of 100 point indicate degree of effort]

- **Thesis.** Does the essay have a clear (complete if then sentence(s)) central thesis with a clear (structured based on the terms of the thesis) introduction providing a road map to the reader (seciont by section)? (20)
- **Organization.** Does the essay have a clear (easy to recognize based on the thesis) overall structure? Are arguments and evidence logically sequenced and organized hierarchically? Is each paragraph in the body of the essay organized around a main idea? Are connections drawn among the key points? Does the essay present a coherent defense of your thesis? (25)
- **Content and use of evidence.** Does the introduction provide adequate (sufficient to develop the argument) background about the topic and the related controversies? Are your arguments well developed, with evidence from all the source materials, including class readings and discussions, personal observations and experience? Are counterarguments considered (*quaestiones disputatae*, as in class)? Does the conclusion draw the essay to a close, highlighting the central points in your argument? Are sources properly cited? (30)

- **Expression.** Are ideas and information articulated in clear (predominantly active voice), fluent prose? (15)
- **Mechanics.** Is the essay free of grammatical, punctuation, and spelling errors? Is the essay of the required length? (10)

We will work in teams and submit individual assignments and posts. Individual final grades are A-F (integer ranges): A (>95), A- (90-94), B+ (85-89), B (80-84), C+ (75-79), C (70-74), D (65-69), F (<65).

Readings

1. Agrawal, A., Gans, J., & Goldfarb, A. (2022). Power and prediction: The disruptive economics of artificial intelligence. Harvard Business Press. The authors examine the most basic unit of analysis: the decision whose key ingredients are prediction and judgment, both performed (so the authors believe) together in our minds. The rise of AI is shifting prediction from humans to machines, relieving people from this cognitive load while increasing the speed and accuracy of decisions. This has profound implications for system-level innovation. When these new systems emerge, they can be disruptive on a global scale. [According to the authors] decision-making confers power. In industry, power confers profits; in society, power confers control. Do we agree with any of this? We will draw some challenges with excerpts from Hirschfeld, M. L. (2018). Aquinas and the market: Toward a humane economy. Harvard University Press. and McCarraher, E. (2019). The enchantments of mammon: how capitalism became the religion of modernity. Harvard University Press.
2. Guardini, R. (1994). Letters from Lake Como: explorations on technology and the human race. Wm. B. Eerdmans Publishing. This book collects a series of letters written by Italian-German theologian-philosopher Romano Guardini in the mid-1920s in which he works out his sense of the challenges of humanity in a culture increasingly dominated by the machine. In the Letters he physically confronts what disquieted him in contemporary civilization, the dominance of technology. Technique has created an alternative universe,self sufficient and almost independent of given nature. Only recently, with our spectacular achievements reaching an unanticipated apex, have we come to understand Heidegger's assertion that technology, more than being our supreme accomplishment, has become a destiny that subjugates its human creators as much as their creations. With prophetic clarity and unsettling farsightedness, Guardini's letters poignantly capture the personal implications and social challenges of living in the technological age — concerns that have now come to fruition a hundred years after he first raised them. To gain clarity and challenge we will read excerpts from Pope Francis, Encyclical Letter, Laudato si': On Care for Our Common Home (2015). and Stango, M. (2023). A Modern Genealogy of the Metaphysics of Information. Communio: International Catholic Review, 50(3), 553-586.

3.Čapek, K. (1922, 2020). RUR, or Rostrum's Universal Robots. The Theatre Guild Library edition, tr. Paul Selver. New York: Doubleday, Page, and Co. R.U.R. is a 1920 science fiction play by the Czech writer Karel Čapek. "R.U.R." stands for Rossumovi Univerzální Roboti (Rossum's Universal Robots, a phrase that has been used as a subtitle in English versions). The play premiered in 1921 and introduced the word "robot" to the English language and to science fiction. The *robota* are the laboring serfs who are made of synthetic organic material Rossum, the company, is a play on the Czech word *rozum* which can variously mean wisdom, reason, even common sense. Yes, the world becomes a robot-economy, but I won't spoil the ending. We will experience love and utility, soul and machine, ultimate moral dilemmas, and by the way, it all comes to a head in the year 2000. The edition contains the producer's very helpful notes and is text of the play presented in New York City at the Garrick Theatre premiering on October 9, 1922. The story continues with Christopher Murray and Nick Johnson's comic book adaptation from the University of Dundee in 1922.

4. Foote, W.G. (2024). Notes on Computational Foundations for Technological Platforms. Unpublished notes. We explore the logic and algebra of George Boole (not Boolean algebra) and expository, and

simple, examples of three pre-trained transformers all in paper and pencil, and for some on spreadsheets if you wish, and the dialectical process of Socratic logic. We use GF(2) and GF(3) arithmetic and algebra to prove Bayes Rule, resolvent and dialectical methods, and *modus tollens / ponens* syllogisms. In the process we confront the testing of hypotheses, how data and hypotheses, and learning interact in AI, and the logic and simple practice of an AI machine from Google brain, yes, using paper and pencil. We will indeed learn to argue constructively with one another with these tools. We will rely on some facility with 5th grade arithmetic and some little bit of 9th grade algebra. We will call on excerpts (which we will simplify) from Vaswani, A. (2017). Attention is all you need. 31st Conference on Neural Information Processing Systems (NIPS 2017), Long Beach, CA, USA. and exposure to (vintage) Ed Eusebi and James A. Brown. 1986. APL2 and AI: a study of search. SIGAPL APL Quote Quad 16, 4 (1986), 295–300. https://doi.org/10.1145/22008.22051 with Fordyce, K., Alfonseca, M., Brown, J., & Sullivan, G. (1992). Solving two-state logic problems with Boolean arrays: an approach unique to APL. ACM SIGAPL APL Quote Quad, 22(4), 10-11, all to gain some perspective and solve a puzzle.

5. Foote, W. G. (2024). Neither a Beast Nor a God: A Philosophical Anthropology of Humanistic Management. Humanistic Management Journal, 1–45. https://doi.org/10.1007/s41463-024-00175-x. I wrote this article to house as my ongoing notes for understanding the reasons for the reasons we have when we manage, decide, organize, essentially giving ourselves to, for, with one another. The mindset (and heart-set too) here is the underpinning of a unity of mind, body, society, and technology and human dignity. Two poignant examples (the lidmen who cook coal for steel production, and the families debt-enslaved by warlords to mine rare earths to enable especially our digital technologies) goaded me into writing this essay. It continues to put my preconceptions in dire peril. We will use the categories and analytical process in this article to challenge ourselves, our interlocutors (including this article, an example of recursive thinking), and our way forward as we use technology in decision making.

Topical course schedule

[The several names below will be referenced in online video lectures and in the readings.]

Topic	Precis	Notes
Topic 1 - May we argue a bit?	Nature of syllogistic reasoning. Ponens, Tollens, fallacies. Dialectics and the horns of dilemma. Algebra might "satisfy" a Robot. Quaestiones Disputatae emerge.	Reasoning from Socrates and Aristotle et al. (2009), Boole (1847), Bellucci, Pietarinen, et al. (2015), Shannon (1938), Jaynes (2003), MacIntyre (1994)
Topic 2 - Can AI think?	What is technology? Can we build a simplet AI? Are AI-run markets thinking about something? Is the AI the value proposition itself?	The Test. The Remainder. A fork in the road. Consciousness. A technocratic paradigm emerges.
Topic 3 - What is the mind?	Is the mind an immaterial thing? Or is the mind the brain? Or does the mind stand to the brain as a computer program stands to the hardware? Will technology save us? What comes first Power or Decisions?	Spirit, matter, and odd ducks. Inversions and des-cartes before de-horse.
Topic 3 - What is knowledge?	Can we give some formal account of "knowledge" able to accommodate people learning new things without leaving their armchairs? Does AI change our views on the "theory of knowledge"?	Love, gift, and logic. Consciousness and good and value. Making, knowing, being. AI memory, agency, text-to-action

Topic	Precis	Notes
Topic 4 - Decisions?	Can we construct decision alternatives consistent with data? If we can do we act on them? How can AI replace this capability?	Decision tradeoffs, Intelligence and rationality, knowing, making and doing
Topic 5 - Infer?	How can we possibly infer the uncertainty and predictability of market decision tradeoffs with machines? Does our simple AI align with our inference machine and with thinking at all?	An inference machine with Watanabe, Nettle and Searle. Hirschfeld and Guardini might have something to say here
Topic 6 - Markets?	Enchanting markets, learning, and technocratic decision ethics	Markets for technology. Enchantment or magic. Back to mind, robots, humans, connectedness.
Topic 7 - Compendium	How do we reconcile mind, markets, and technology? How do we propose to incorporate our findings in management education, practices, and policies?	Final essay preparation and presentation

Other matters

Assignment Formatting

All assignments must be turned in electronically, through the learning management system, by each student. All assignments will involve writing a combination of code and actual prose. You must submit your assignment in a format which allows for the combination of the two, and the automatic execution of all your code. The easiest way to do this is to use `R Markdown`. `R Markdown` also allows the use of interactive modeling through `Shiny` applications.

Work submitted as Word files, unformatted plain text, etc., are not acceptable at any time during the course. Each assignment will require the submission of a pddf or html file. Managing the data base of submitted assignments throughout the course will be aided by standards including file name construction for assignment submission. To this end, every file submitted must have a file name which includes the student's name, course identifier, and clearly indicates the type of assignment (project) and its number (week). Here is the format we will use:

`yourName_courseidentifier_Assignment#.ext`, where # is the essay number and ext is the file name extension.

For example W.G. Foote would submit a **pdf** file with this filename:

- `wgfoote_MBA6XX_Essay1.pdf`

Course Specific Policies

Students are expected to behave in a professional and courteous manner at all times when interacting with all members of the course learning community. Respect for others is demonstrated through attendance, meaningful participation, and punctuality. Every effort should be made to be present for each session, if not feasible, view the recording of each session, especially since weekly assignments will be made conditional on content in live sessions.

All essays must be completed and submitted by the due dates and times set out. This will allow the entire class to review and revise submissions in a timely fashion. Submissions to `lms.manhattan.edu` are based on Eastern Time (UTC +5).

- Late submissions will result in student inability to accumulate the knowledge needed to advance to the next week's coverage of course topics.
- Late submission will also delay necessary instructor feedback to the student in a timely fashion.
- As the course continues to layer on more skills and capabilities, a late submission with inaccurate or incomplete requirements will only deprecate the student's ability to successfully complete future assignments, let alone the final essay.

So, don't be late. Due dates are posted in the LMS (Learning Management System) to help you pace your progress through the very quickly rolling out of the several weeks of the course term. Due dates are not deadlines. However, there is one deadline from the Registrar: all grades (including Incompletes) must be posted within 48 hours of the end of the course term.

Academic integrity

The Manhattan University Academic Integrity Policy holds students accountable for the integrity of the work they submit. Students should be familiar with the Policy and know that it is their responsibility to learn about instructor and general academic expectations with regard to proper collection, usage, and citation of sources in written work. The policy also governs the integrity of work submitted in exams and assignments as well as the veracity of signatures on attendance sheets and other verifications of participation in class activities. For more information and the complete policy, see the Manhattan College Catalog.

Students with disabilities

If you need academic accommodations due to a disability, then you should immediately register with the Director of the Specialized Resource Center (SRC). The SRC at Manhattan University authorizes special accommodations for students with disabilities. If you have a documented disability and you wish to discuss academic accommodations, please contact me within the first Topic of class.

Aristotle, Gisela, Striker et al. 2009. *Aristotle's Prior Analytics Book i: Translated with an Introduction and Commentary*. Oxford University Press.

Bellucci, Francesco, Ahti-Veikko Pietarinen, et al. 2015. "Peirce's Logic." *Internet Encyclopedia of Philosophy*.

Boole, George. 1847. *The Mathematical Analysis of Logic*. CreateSpace Independent Publishing Platform.

Jaynes, Edwin T. 2003. *Probability Theory: The Logic of Science*. Cambridge university press.

MacIntyre, Alasdair. 1994. *Three Rival Versions of Moral Enquiry: Encyclopaedia, Genealogy, and Tradition*. University of Notre Dame Pess.

Shannon, Claude E. 1938. "A Symbolic Analysis of Relay and Switching Circuits." *Electrical Engineering* 57 (12): 713–23.