STS 201 – Understanding Technological Society: Intro STS

Program in Science, Technology & Society – New Jersey Institute of Technology

Fall 2024 Course Syllabus

Instructor: Dr. Renan Silva
Department of Humanities and Social Sciences
Email: rg799@njit.edu
Office Hours: by appointment (email me in advance)

Weekdays: Mondays and Wednesdays
Time: 10:00-11:20AM
Room: Cullimore Lecture Hall #
Course materials: https://canvas.njit.edu

Course description

We are constantly debating the importance of technologies in our lives, but rarely discuss our role in making technologies economically, politically, ethically, and culturally feasible. Also, less time is dedicated to the examination of how human values and beliefs affect the design, development, and diffusion of new technologies in society. This course aims to encourage students to adopt multiple approaches from humanities and social sciences to think critically about implications of technologies in modern society.

This course serves as an introduction to the social sciences: anthropology, communication, economics, sociology, geography, history, political science, sustainability, and psychology (and their influence on technology, society, and technological society). Much of the course focuses on technology and its role in addressing and improving local, national, and global issues, as well as its effect and relationship with the global ecological system and sustainability.

A problem-centered and task-oriented course that integrates social science theory and practice into the leading public issues of a technological society. Students learn critical thinking through hands-on assignments. The course emphasizes student understanding of social institutions that directly affect technological development and professional careers. This course can be used to satisfy either the three credit 200 GER in History and Humanities or the three credit GER in Social Sciences, but not both.

No prerequisites required.

Course learning outcomes

STS 201 aims to teach students to:

- provide theories and tools for students to analyze multiple human factors that have led society to pursue scientific and technological entrepreneurships in the past and contemporary world;
- navigate through introductory-level STS concepts, theoretical frameworks, and debates;
- examine scientific and technological development critically and to be aware of its ethical, cultural, organizational, and socio-economic challenges;
- advance in future professional projects using critical thinking, humanity and social justice-driven judgment, personal analytical views, and published resources;
- deliver strong arguments about the relationship between science, technology, and society in a creative way.

Course materials

All course materials will be available at the course website **(https://canvas.njit.edu)**. You should check the syllabus often. Materials needed for your next class will be available right after the end of the previous class. You will be alerted in classroom if there ANY changes to the scheduled readings.

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.

If you are uncertain as to what constitutes plagiarism, please refer to the article entitled "Plagiarism Lines Blur for Students in the Digital Age" available on the course website. Note on the Use of Generative Artificial Intelligence In accordance with university policies, the uncited use of generative artificial intelligence in the form of (but not limited to) ChatGPT and Grammarly is regarded as a violation of the above-referenced statement on academic integrity. If a student uses one of these technologies at any stage of the writing process without full and complete acknowledgement and attribution it will be treated as plagiarism and reported to the Office of the Dean of Students for further review. Depending on the specific circumstances, the outcome of the adjudication process may involve failure on the specific assignment or in certain instances failure for the course.

Assignments

The following activities are designed to help you achieve the class objectives. Your grade will include these components:

- **Course Engagement (20%)**: You must attend class sessions AND engage with what is being taught. You must demonstrate that you are up to date with readings. Course engagement is a combination of your attendance and participation, i.e., capacity to actively contribute to classes' debates, questioning and discussions related to the readings and presentations. The most important outcome of this course is improving students' analytic skills about the ambivalence of technological systems in society, and to get introduced to concepts and theoretical frameworks on STS to improve critical thinking about real world problems.

- **Critical Report (15%)**: A Critical Report is a short, max. 2-pages document (Double-spaced, Times New Roman, Font size: 12; margins: 1,5), in which the student exercises the capability of building associations between the literature and a practical case. A technology will be selected by the student - one that has been

considered problematic in society (ex.: stem-cell research, a new medicine, a new product/material, a social media, a nuclear power plant project, an aircraft project, etc.). Be creative! The critical report presents how the literature accessed in the course (cite what Week and authors) helps the student to understand the reasons and cultural/economic/political questions that makes that technology controversial/problematic. You can find many materials, videos, discussion, blog post, etc. to support your analysis. **Attention**: Work generated with ChatGPT are not allowed - software will be used to check ChatGPT-generated reports.

- **Group seminars (20%)**: Themes will be distributed among student groups. Themes are related to technological development in the fields of artificial intelligence, ethics of scientific practice, synthetic human embryos, smart cities, long Covid, gene editing technologies, neurotechnology, and robot scientists. I encourage students to incorporate their personal interests into selected themes, for example their knowledge about film, sci-fi, arts and culture in general, and how it relates to their themes. Students will be graded by their capacity to articulate theories and literature, quality of presentations, and discussions held in classroom.

- **Midterm Exam (20%)**: The midterm is composed of an open essay question related to a short text provided by the instructor. Responses must be based in the text interpretation, and in relation with previous readings, theories, and debates done in classroom. Students are allowed to do consultation in printed materials.

- **Final Exam (25%):** The final Exam is based in all content presented during the fall semester. It includes all readings, materials, discussions, and debates done in classroom AND the content, critics, and analysis of ALL thematic group seminars. It is composed by 20 multiple choice questions.

Verification of Presence - Academic Engagement Assignment

Beginning with the Fall 2024 semester, our process for conducting "Verification of Presence" will differ substantially from past practice. **Now students have to self-report their presence**. Instructors will no longer be required to manually take and record attendance in order to verify the presence of each student. Please, go to you Canvas section and complete the "Academic Engagement Assignment". Students will be asked to reflect on what they hope to get out of your class. Completion of this assignment will serve as verification of presence for the given student. Please note that this assignment need not be graded nor count toward the student's final grade.

Grading

Your final grade will be assigned based on the following scale:

A	=	100% - 90%
B+	=	89.99% - 86%
B	=	85.99% - 80%
C+	=	79.99% - 76%
C	=	75.99% - 70%
D	=	69.99% - 60%
F	=	< 60%

Course Readings

Reading materials are mainly composed by short articles, commentary pieces and YouTube videos and interviews. All materials will be provided in PDF form and available in Canvas. I expect that students come to class reasonably able to answer the question of "what did the author argue in this reading", which requires you to grasp the general argument provided by the author. If you find yourself spending too much time getting through the readings, feel free to come into office hours.

Course schedule

Readings and assignments are to be completed by the beginning of class on the date they are listed.

Welcome Session | [Wednesday], September 4: Course introduction and Syllabus.

MODULE I: SCIENCE AND TECHNOLOGY IN SOCIETY: CONCEPTS AND TOOLS

Week 1 – Science and Technology as Human Culture

- [Monday] September 9: Science, Technology and Society.
  Readings: Macnaghten P. Science and Technology Studies
  In.: Warf B. (Ed.) (2010) Encyclopedia of Geography. Publisher: Sage.

- [Wednesday] September 11: Social Construction of Science.
  Reading: James Zimring (2019) Why Science is a Social Construct? Salon, 1-2. Available at https://www.salon.com/2019/12/22/why-science-is-a-social-construct/

Week 2 – Systems of knowledge production

- [Monday] September 16: Mode 1 and Mode 2 (Part I).
  Readings: Gibbons et. al. The New Production of Knowledge:
  The Dynamics of Science and Research in Contemporary Societies. [pp. 1-8].

- [Wednesday] September 18: Mode 1 and Mode 2 (Part II).
  Reading: Gibbons et. al. The New Production of Knowledge:
  The Dynamics of Science and Research in Contemporary Societies. [pp. 8-16].

Week 3 – Infrastructures and open-ended design

- [Monday] September 23: Infrastructures
  Reading: Star SL (1999) The Ethnography of Infrastructure. *American Behavioral Scientist*, 43(3), 377-391. https://doi.org/10.1177/00027649921955326

- [Wednesday] September 25: Knowledge and open-ended design
  Video: Nowotny H, von Seggern, H. Science walking: Helga Nowotny in a conversation with Hille von Seggern https://www.youtube.com/watch?v=Uj4CRVTfc0A&t=5s

Week 4 – Scientific and Technological Change.

- [Monday] September 30: Scientific Revolution.
  Reading: Andres Felipe Barrero. Thomas Kuhn On Scientific Revolution: How Does Scientific Change Work? TheCollector.com, Aug.19, 2023, https://www.thecollector.com/thomas-kuhn-on-scientific-revolution/.

- [Wednesday] October 2: The Creative destruction.
  Readings: Joseph Schumpeter (1942) Capitalism, Socialism and Democracy. [Chapter VII: *The process of creative destruction*. pp. 81-86].

MODULE II CONTEMPORARY ISSUES OF TECHNOLOGICAL SOCIETIES

Week 5 – Criticizing Scientific and Technological Systems

- [Monday] October 7: Techno-solutionism
  Readings: Nawal Arjini. Science will not come on a White Horse with a Solution. The Nation. April 6, 2020. Available at https://www.thenation.com/article/society/sheila-jasanoff-interview-coronavirus/

- [Wednesday] October 9: Biomedicalization of societies
  Reading: Clarke, A.E. (2014). Biomedicalization. In The Wiley Blackwell Encyclopedia of Health, Illness, Behavior, and Society (eds W.C. Cockerham, R. Dingwall and S. Quah).

Week 6 – Contemporary Issues in Science, Technology and Society

DUE: CRITICAL REPORT – OCTOBER 14.

- [Monday] October 14: Techno-Racism
  Reading: People of color have a new enemy: techno-racism. CNN https://www.cnn.com/2021/05/09/us/techno-racism-explainer-trnd/index.html
  Support Mat.: "Racist technology in action" https://racismandtechnology.center/theme/racist-technology-in-action/

- [Wednesday] October 16, Gender issues in STEM.
  Reading: Jeremy Pitt and Kate Highnam (2024). Gender Equality in Engineering: An Institutional Reflection. IEEE Technology and Society. February 28th, 2024. Page 1-6. Available at https://technologyandsociety.org/gender-equality-in-engineering-an-institutional-reflection/

Week 7 – Converging sciences and technologies

- [Monday] October 21: Converging technologies.
  Videos: (A) Leading Scientists Discuss Converging Technologies: George Whitesides (Harvard University) https://www.youtube.com/watch?v=KGdQzf4imsM
  (B) Geralldine Hamilton Body parts on a chip. https://www.ted.com/talks/geraldine_hamilton_body_parts_on_a_chip?subtitle=en

- [Wednesday] October 23, Technology and social regulations
  Reading: The FDA no longer requires all drugs to be tested on animals before human trials. Science. https://www.science.org/content/article/fda-no-longer-needs-require-animal-tests-human-drug-trials
  Videos: (A) Perspective from activists: https://www.youtube.com/watch?v=HwG9wy5pQHg
  (B) Perspective from politicians: FDA Modernization Act Press Conference. https://www.youtube.com/watch?v=PhagcDKMjzY

Week 8 – The cost of technological innovations

- [Monday] October 28. Lithium batteries and Ozempic epidemic
  Readings: (A) The future of four wheels is all electric, Goldman Sachs. https://www.goldmansachs.com/insights/articles/the-future-of-four-wheels-is-all-electric
  (B) Paul et. al. The Ozempic 'epidemic' and its dangerous consequences. https://mjlh.mcgill.ca/2024/03/12/the-ozempic-epidemic-and-its-dangerous-consequences/

- [Wednesday] October 30. Undesirable social impact of tech innovations
  Readings: The Environmental Impacts of Cobalt Mining in Congo. EARTH.ORG https://earth.org/cobalt-mining-in-congo/
  Video: The True Cost of Cobalt | People and Power – Al Jazeera English. https://www.youtube.com/watch?v=sZRRJkSNKug

Week 9 – Midterm and group seminar preparation session

- [Monday] November 4, **MIDTERM**
- [Wednesday] November 6, Group seminar prep.: thematic seminar guide, expectations, and Q&A

MODULE III GROUP SEMINARS: TRENDS IN SCIENCE AND TECHNOLOGY

Week 10 – Artificial Intelligence and Ethics of scientific practice

- [Monday] November 11, Artificial Intelligence
  Reading: Acemoglu D. (2024) Are We Ready for AI Creative Destruction? https://www.project-syndicate.org/commentary/ai-age-needs-more-nuanced-view-of-creative-destruction-disruptive-innovation-by-daron-acemoglu-2024-04

- [Wednesday] November 13, Ethics of scientific practice
  Reading: Wolpe, P. R. 2006. Reasons scientists avoid thinking about ethics. Cell 125 (6):1023–5. https://doi.org/10.1016/j.cell.2006.06.001

Week 11 – Synthetic human embryos and Smart cities

- [Monday] November 18, Synthetic human embryos
  Readings: Insoo Hyun (2023). New Human Embryo Models Spark Needless Controversy. https://www.scientificamerican.com/article/new-human-embryo-models-spark-needless-controversy/

- [Wednesday] November 20, Smart Cities
  Reading: The truth about smart cities: "In the end, they will destroy democracy". *The Guardian*, Wed 17 Dec. 2014. https://www.theguardian.com/cities/2014/dec/17/truth-smart-city-destroy-democracy-urban-thinkers-buzzphrase

Week 12 – Neurotechnology and Robot Scientists

- [Monday] November 25, Neurotechnology
  Reading Yuste, R., Goering, S., Arcas, B. et al. Four ethical priorities for neurotechnologies and AI. Nature 551, 159–163 (2017). https://doi.org/10.1038/551159a

- [Wednesday] November 27, Robot Scientists
  Reading: R. D. King, V. Schuler Costa, C. Mellingwood and L. N. Soldatova, Automating Sciences: Philosophical and Social Dimensions, in *IEEE Technology and Society Magazine*, vol. 37, pp. 40-46, March 2018.

Week 13 – Long Covid and Human Genome editing.

- [Monday] December 2, Long Covid
  Readings: (1) Kristiansen N. (2024) Is long Covid completely normal, a new disease, or mass hysteria? (2) Au L et. al. (2023) Long Covid requires a global response centered on equity and dialogue. Glob Health Action. 2023 Dec 31;16(1):2244757. https://doi.org/10.1080/16549716.2023.2244757

- [Wednesday] December 4, Human genome editing.
  Reading: Raposo VL. The First Chinese Edited Babies: A Leap of Faith in Science. JBRA Assist Reprod. 2019 Aug 22;23(3):197-199. https://doi.org/10.5935/1518-0557.20190042

Week 14 – Wrap up session and final exam prep.

- [Monday] December 9: Seminars wrap up discussion, seminars highlights and debate.
- [Wednesday] December 11: Final exam prep. session. Instructions, Q&A.

December 16: **FINAL EXAM**.