# History of Computing Fall 2020
# HIST 2624 (CRN 91468):

## *Instructor:*

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## *Course Requirements*

The course Data in Social Contexts: History of Computing asks you to study the developments of computing technology while also working through your own perspective on the topic as a student of any other discipline. This course is structured around a series of readings, online lectures, online discussions fueled by question-and-answer assignments, and various other assignments to help you engage with the material.

This class is designed to be an "easy B" course. Doing all the reading, understanding all of the material, and being able to recreate it will earn you a "B". An "A" requires more insight, a willingness to creatively engage with and transform the material, and going above and beyond a straightforward understanding of the materials.

This is a new class, and between that and the pandemic I want to make sure that we're being flexible about our time and efforts, while still getting the most we can out of our time together. If you take a crack at the readings, show up to the online meetings, and participate in online discussions, and then write some assignments, everything should work out just fine.

There are no prerequisites for this course.

## *Readings and Lectures*

Except where noted, Mondays of each week will be devoted to online lecture held over Zoom or some other online meeting software to which you, as students, will have access. You will be given links and login instructions, in advance. Wednesdays will be reserved for office hours, class questions, and group discussion via Canvas' features.

Each week has required readings as well as secondary readings that provide additional context and clarification on the primary readings. While they are recommended, you are not expected to read every secondary reading; however, you should make sure to read at least some of them, so you can incorporate information from at least one secondary reading into each main assignment.

## ***Questions and Answers***

Every week, you will have the opportunity to post a list of questions that have occurred to you while doing the reading.

When writing, remember that you don't need to know the answers to the questions you ask—in fact, the point of the assignment is to discuss with the class to get answers to the questions that you have.

I ask you to assign a point value to each question and to post enough questions to total ten points per week. These point values reflect how difficult it is to answer the question.

Questions may be worth 1-5 points:

1 point: Definitions of social science or humanities terms.

2 points: Questions that are fact-checking or can be answered by looking at a single source.

3 points: Qualitative high-level questions that bring together multiple sources.

4 points: Questions that compare and contrast different ideas or assess the relative importance of different information.

5 points: Larger contextual questions that require research outside of the course materials to answer.

Here are several example questions with point values:

1 point: "What is software?"

2 points: "Who was Alan Turing?"

3 points: "Why did the pay rates for computing shift throughout the 20$^{thc}$ century?"

4 points: "Compare and contrast the relative impacts of the rise of software and the development of the mainframe."

5 points: "How, if at all, might Alan Turing's identity as a gay man have affected his development of codes and code breaking technology?"

## ***Discussions***

Each week you will participate in a discussion of the previous week's materials, in the online meeting, on the discussion board, or both, using the questions you developed as a starting point. This will be analogous to a class participation credit.

## ***Study Guides***

The study guide assignment is intended to help you engage with and retain the material covered in the course. Instead of exams, which often call for short-term memorization and regurgitation of information, the study guides are your opportunity to show that you've done the reading and have thought about it. The study guides you create should be comprehensive and inclusive of all the weeks of readings, since the last study guide. For the first study guide, cover weeks 1-4.

The study guides can take whatever form you want.

In the study guides, I'm really looking for signs that you've *thought about and internalized* all of the material, not that you can regurgitate it. There are a lot of ways to show this, and while you can make the study guide however you want, traditional formats like flash cards, notes, and other straight recitations of facts are actually the most difficult to do while still putting your own spin on it.

The criteria that I use when grading are:

1. The facts are correct and the study guide shows comprehension of all the primary readings, including at least one secondary reading for each

2. Shows thought *beyond* what is in the readings, such as by drawing connections to other materials (either in or outside of the class), by reframing the readings, or by asking generative and insightful

See the below grade-by-grade rubric for more information:

**For the grade of A- to A (9, 9.5, or 10 pts):** In addition to meeting all the requirements for the B grade**,** asks generative questions that point readers in the direction of more sustained inquiry and discussion. Provides insightful analysis of readings and classroom discussions. Goes beyond issues raised in class.

**For the grade of B- to B (8 or 8.5 pts):** Shows clear comprehension of the readings, and understanding of classroom discussions and assignment. Is thoughtful and reflective, written in a clear, comprehensible style without major spelling or grammatical errors. Must include reference to the weekly readings, as well as citation for each reference.

**For the grade of C- to C (7 or 7.5 pts):** Appropriately addresses the readings, classroom discussions, and assignment, but demonstrates more limited comprehension, thought, and reflection. Is not entirely clear and comprehensible. May have significant grammatical and/or spelling errors.

**For the grade of D- to D (6 or 6.5 pts):** Significantly fails to comprehend the readings, classroom discussions, and assignment. Demonstrates very little thought and reflection. May be unclear to the point of being almost incomprehensible. May have major grammatical and spelling errors.

**For the grade of F: (5.5 pts or below):** Entirely fails to comprehend the readings, classroom discussions, and assignment. No thought or reflection. Entirely unclear or incomprehensible. Major grammatical and spelling errors.

## *Grading*

I guarantee the return of homeworks within 7—10 days.

I re-grade assignments without prejudice according to the following policy: Within one week of receiving a graded assignment, you submit a written request for re-grading with an explanation for why you think you deserve more points. I will review it and respond in writing with a decision.

The course works on a 90-100, 80-90, etc., scale for final grading. I do award +'s and –' s. There is no curve.

If you anticipate extenuating circumstances that may prevent you from completing an assignment, please try to arrange an alternate deadline or assignment in advance. If you need an extension, let me know. My goal is to make sure I'm not trying to grade every single assignment in the last week of class.

If you have a medical emergency or family emergency which will impact your participation long-term, please let me know as soon as possible, and then contact the Dean of Students Office for documentation.

## *Health Resources*

**Cook Counseling Center:** https://ucc.vt.edu/
**Schiffert Health Center:** https://healthcenter.vt.edu/

## *Inclusion Statement*

Students with a disability recognized by the Americans with Disabilities Act should contact the **Services for Students with Disabilities** in the Dean of Students' office for any accommodations. Students with disabilities are responsible for self- identification and are encouraged to contact **SSD**. If you require any special arrangements or considerations for the class, please contact me immediately to arrange an appointment to discuss accommodations. See: http://www.ssd.vt.edu/registering/students_disabilities/students_disabilities.html.

All students learn differently. If you are concerned that your learning style is not currently accommodated in the class, please contact me to discuss your individual learning needs.

If the official Virginia Tech roster does not list your preferred name or indicate your preferred pronouns, please let me know as soon as possible so I can adjust my roster accordingly.

This course strives to uphold the Virginia Tech Principles of Community. If you are concerned at any point that I or a fellow student have failed to uphold these Principles, please notify me.

## ***Other Forms of Assistance***

The Virginia Tech Writing Center has online resources as well as personal assistance to help strengthen your writing, which is crucial to success in any future career. If you feel that you are missing the mark or if your writing is not accomplishing what you want, check them out at http://www.composition.english.vt.edu/wc/WC_Home.htmlor call 231-5436 or visit 340 Shanks Hall.

The Dean of Students office can provide excused absences in emergencies and has student advocacy resources: http://www.dos.vt.edu/student_advocacy/index.html

## ***Honor Code***

**Syllabus Statement:** The Undergraduate Honor Code pledge that each member of the university community agrees to abide by states:

*"As a Hokie, I will conduct myself with honor and integrity at all times. I will not lie, cheat, or steal, nor will I accept the actions of those who do."*

Students enrolled in this course are responsible for abiding by the Honor Code. A student who has doubts about how the Honor Code applies to any assignment is responsible for obtaining specific guidance from the course instructor before submitting the assignment for evaluation.

Ignorance of the rules does not exclude any member of the University community from the requirements and expectations of the Honor Code. Academic integrity expectations are the same for online classes as they are for in person classes. All university policies and procedures apply in any Virginia Tech academic environment.

**Honor Code Pledge for Assignments:** The Virginia Tech honor code pledge for assignments is as follows:

*"I have neither given nor received unauthorized assistance on this assignment."*

The pledge is to be written out on all graded assignments at the university and signed by the student. The honor pledge represents both an expression of the student's support of the honor code and a commitment to uphold the academic standards at Virginia Tech.

For additional information about the Honor Code, please visit:
https://www.honorsystem.vt.edu/

Commission of any of the following acts shall constitute academic misconduct. This listing is not, however, exclusive of other acts that may reasonably be said to constitute academic misconduct. Clarification is provided for each definition with some examples of prohibited behaviors in the Undergraduate Honor Code Manual located at:
https://www.honorsystem.vt.edu/

1. **CHEATING:** Cheating includes the intentional use of unauthorized materials, information, notes, study aids or other devices or materials in any academic exercise, or attempts thereof.

2. **PLAGIARISM:** Plagiarism includes the copying of the language, structure, programming, computer code, ideas, and/or thoughts of another and passing off the same as one's own original work, or attempts thereof.
3. **FALSIFICATION:** Falsification includes the statement of any untruth, either verbally or in writing, with respect to any element of one's academic work, or attempts thereof.
4. **FABRICATION:** Fabrication includes making up data and results, and recording or reporting them, or submitting fabricated documents, or attempts thereof.
5. **MULTIPLE SUBMISSION:** Multiple submission involves the submission for credit—without authorization of the instructor receiving the work—of substantial portions of any work (including oral reports) previously submitted for credit at any academic institution, or attempts thereof.
6. **COMPLICITY:** Complicity includes intentionally helping another to engage in an act of academic misconduct, or attempts thereof.
7. **VIOLATION OF UNIVERSITY, COLLEGE, DEPARTMENTAL, PROGRAM, COURSE, OR FACULTY RULES:** The violation of any University, College, Departmental, Program, Course, or Faculty Rules relating to academic matters that may lead to an unfair academic advantage by the student violating the rule(s).

The Office of Undergraduate Academic Integrity occasionally sponsors "Understanding the Virginia Tech Honor Code" sessions for students during the semester. These sessions are interactive sessions in which the Office of Undergraduate Academic Integrity discusses what constitutes a violation of the Honor Code and ways in which students can avoid violations of the Honor Code. Specific examples will be utilized to assist students in better understanding the University's expectations. The same material will be covered at each session. If they are offered, this semester, I will let you know the dates and times as they are made available.

**You are encouraged to complete the Academic Integrity Module** available on Canvas.

**Academic Misconduct Sanctions:** It is important to understand that there are serious sanctions associated with violating the Honor Code and these can have a significant impact on your course grade and academic career. If you have questions or are unclear about what constitutes academic misconduct on an assignment, please speak with me. I take the Honor Code very seriously in this course. The normal sanction I will recommend for a violation of the Honor Code is an **F*** sanction as your final course grade.

The F represents failure in the course. The "*****" is intended to identify a student who has failed to uphold the values of academic integrity at Virginia Tech. A student who receives a sanction of **F*** as their final course grade shall have it documented on their transcript with the notation "FAILURE DUE TO ACADEMIC HONOR CODE VIOLATION." You would be required to complete an education program administered by the Honor System in order to have the "*" and notation "FAILURE DUE TO ACADEMIC HONOR CODE VIOLATION" removed from your transcript.

The "F" however would be permanently on your transcript.

# ***History of Computing: Fall 2020 Weekly Schedule***

## *Week 1: What is Computing?*

- *Computer: A History of the Information Machine*, Martin Campbell-Kelly, William Aspray, Nathan Ensmenger, and Jeffrey R. Yost (2014, 3rd edition), VT library ebook
    - —Introduction and Chapter 1: https://ebookcentral.proquest.com/lib/vt/detail.action?docID=1121291
- "On with the Motley" from David Turnbull. *Masons, Tricksters and Cartographers: Comparative Studies in the Sociology of Scientific and Indigenous Knowledge*. Studies in the History of Science, Technology and Medicine. London: Routledge, 2000.
    - https://canvas.vt.edu/courses/58198/files/4550834/download?verifier=zsinKRbl87hjJNaEqh75KwJDPizrLRJ67TOkg8zd&wrap=1
- "Confucianism and Education":
    - https://web.archive.org/web/20190317225406/https://plato.stanford.edu/entries/confucius/#ConEdu
- Katherine Johnson Interviews at Visionary Project:
    - http://www.visionaryproject.org/johnsonkatherine/.

## *Week 2: Computers as We Know Them.*

- *Computer* Chapters 2 and 3:
    - https://ebookcentral.proquest.com/lib/vt/detail.action?docID=1121291
- *Affect and Artificial Intelligence:* Chapter 1
    - https://ebookcentral.proquest.com/lib/vt/detail.action?docID=3444341
- "Overlooked No More: Alan Turing, Condemned Code Breaker and Computer Visionary," Alan Cowell. *The New York Times*, June 5, 2019
    - https://www.nytimes.com./2019/06/05/obituaries/alan-turing-overlooked.html.

## *Week 3: Who Were Computers (1)?*

- *Computer* Chapters 4 and 5:
    - https://ebookcentral.proquest.com/lib/vt/detail.action?docID=1121291

- Grace Hopper, “Oral History,” recorded 1980, Computer History Museum
    - Pg 26—41: http://archive.computerhistory.org/resources/text/Oral_History/Hopper_Grace/102702026.05.01.pdf
- *Human Computers: The Women in Aeronautical Research,* Beverly Golemba. 1995 manuscript, NASA Langley VA
    - Introduction: https://crgis.ndc.nasa.gov/crgis/images/c/c7/Golemba.pdf

## *Week 4: Who Were Computers (2)?*

- *Computer* Chapter 6:
    - https://ebookcentral.proquest.com/lib/vt/detail.action?docID=1121291
- “Why tech’s gender problem is nothing new,” Mar Hicks. *The Guardian,* October 12, 2018
    - https://www.theguardian.com/technology/2018/oct/11/tech-gender-problem-amazon-facebook-bias-women
- “Tech-Bro Culture was Written in the Code,” Joy Lisi Rankin. *Slate,* November 1, 2018
    - https://slate.com/technology/2018/11/dartmouth-basic-computer-programmers-tech-bros.html

## *Week 5: Who Computed?*

- *Computer* Chapter 8:
    - https://ebookcentral.proquest.com/lib/vt/detail.action?docID=1121291
- “The First 1940s Coders Were Women–So How Did Tech Bros Take Over?”
    - https://www.history.com/news/coding-used-to-be-a-womans-job-so-it-was-paid-less-and-undervalued

## *Week 6: Software and Space*

- *Computer* Chapter 9:
    - https://ebookcentral.proquest.com/lib/vt/detail.action?docID=1121291

- "Cyborgs and space." Manfred E. Clynes & Nathan S. Kline. *Astronautics*. September 1960.
    - http://web.mit.edu/digitalapollo/Documents/Chapter1/cyborgs.pdf

## *Week 7: Personal Computing*

- *Computer* Chapters 10 and 11:
    - https://ebookcentral.proquest.com/lib/vt/detail.action?docID=1121291
- Steve Jobs, Interview with *Rolling Stone*, June 16, 1994
    - https://www.rollingstone.com/culture/culture-news/steve-jobs-in-1994-the-rolling-stone-interview-231132/.

## *Week 8: The Internet, Then and Now*

- *Computer* Chapter 12:
    - https://ebookcentral.proquest.com/lib/vt/detail.action?docID=1121291
- Aaron Swartz, "Networks" Interview for Steal This Film 2, April 2007
    - https://commons.wikimedia.org/w/index.php?title=File%3AAaron_Swartz_-_The_Network_Transformation.webm
- "How Google Search Works"
    - https://support.google.com/webmasters/answer/70897?hl=en.

## *Week 9: Artifacts, Algorithms, and Politics*

- "Do Artifacts Have Politics." Langdon Winner, 1980.
    - https://www.jstor.org/stable/20024652
- "Technology and History: 'Kranzberg's Laws'." Melvin Kranzberg, 1986.
    - https://www.jstor.org/stable/pdf/3105385.pdf.
- "Semantics Derived Automatically From Language Corpora Contain Human-Like Biases." 14 Apr 2017 : 183-186.
    - http://science.sciencemag.org/content/356/6334/183.full.

- "Can Computers Be Feminist?" September 16, 2015
    - http://www.firstpersonscholar.com/can-computers-be-feminists/

## *Week 10: Computation and Lived Experience: Who and what gets computed?*

- Virginia Eubanks' *Automating Inequality*
    - Introduction and Chapter 1: Automating_Inequality_-_Eubanks_-_Intro-Ch1.pdf
- *Algorithms of Oppression* Introduction and Conclusion:
    - https://virginiatech.on.worldcat.org/detailed-record/987591529?databaseList=638&scope=sz:38864
- "What Happened When Dylann Roof Asked Google For Information About Race?" Rebecca Hersher. NPR's The Two-Way. Jan 10, 2017
    - https://www.npr.org/sections/thetwo-way/2017/01/10/508363607/what-happened-when-dylann-roof-asked-google-for-information-about-race

## *Week 11: Who computes? Who is computed?*

- "Love Synth Pop? Thank Wendy Carlos, the Trans Woman Who Invented It."
    - http://www.newnownext.com/wendy-carlos-transgender-synthpop-pioneer/10/2019/
    - Wendy Carlos' Personal Biography:
        - http://www.wendycarlos.com/biog.html.
    - "Data, Technology, and Gender: Thinking About (and From) Trans Lives." Hoffmann, Anna Lauren. 2017.
        - https://static1.squarespace.com/static/5b8ab61f697a983fd6b04c38/t/5ba2dd7c0ebbe8e795096d94/1537400206236/Spaces-Ch-1-and-2-Hoffmann-and-Wittkower.pdf
    - "There is a blind spot in AI research," Kate Crawford & Ryan Calo. Nature, October 2016
        - http://www.nature.com/news/there-is-a-blind-spot-in-ai-research-1.20805.

- "How Algorithmic Bias Hurts People With Disabilities"
    - https://slate.com/technology/2020/02/algorithmic-bias-people-with-disabilities.html.
- STGlobal Knowledge in Action Webinar: "The Racial Politics of Science and Academia;" organized by the STGlobal Consortium; August 7, 2020
    - https://www.youtube.com/watch?v=xByovHCrWVQ

## *Week 12: Computation and Race*

- *Dark Matters: On the Surveillance of Blackness*. Simone Browne. Durham, NC: Duke University Press, 2015.
    - Introduction and Chapter 1: https://ebookcentral.proquest.com/lib/vt/reader.action?docID=2194890&ppg=12
- *Race after Technology: Abolitionist Tools for the New Jim Code,* Ruha Benjamin.
    - Introduction: https://ebookcentral.proquest.com/lib/vt/reader.action?docID=5820427&ppg=9
- "Machine Bias: There's software used across the country to predict future criminals. And it's biased against blacks." ProPublica. May 23, 2016.
    - https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing.

## *Week 13: Computation and Lived Experience: Consequences*

- "Data Violence and How Bad Engineering Choices Can Damage Society." Anna Lauren Hoffmann
    - https://medium.com/s/story/data-violence-and-how-bad-engineering-choices-can-damage-society-39e44150e1d4
- "US's digital divide 'is going to kill people' as Covid 19 exposes inequalities" April 13, 2020.
    - https://www.theguardian.com/world/2020/apr/13/coronavirus-covid-19-exposes-cracks-us-digital-divide
- "College Made Them Feel Equal. The Virus Exposed How Unequal Their Lives Are" April 4, 2020.

- https://www.nytimes.com/2020/04/04/us/politics/coronavirus-zoom-college-classes.html

## *Week 14: How Might We Compute?*

- "Crip technoscience manifesto." Hamraie, A., & Fritsch, K. *Catalyst: Feminism, Theory, Technoscience, 5*(1), 1-34. http://www.catalystjournal.org | ISSN: 2380-3312 (2919).
  - https://catalystjournal.org/index.php/catalyst/article/view/29607/24771
- "Can You Make an AI That Isn't Ableist?" Karen Hao. MIT Technology Review. November 28, 2018.
  - https://www.technologyreview.com/s/612489/can-you-make-an-ai-that-isnt-ableist/.
- "The Case for Disabled Astronauts." Sheri Wells-Jensen. 2018.
  - https://blogs.scientificamerican.com/observations/the-case-for-disabled-astronauts/.
- "'Means Well' Technology: Technology and the Internet of Good Intentions." Kane, Natalie. 2016.
  - https://medium.com/@nd_kane/means-well-technology-and-the-internet-of-good-intentions-3726ad580c9e.
- "'Nothing About Us Without Us': Transforming Participatory Research and Ethics in Human Systems Engineering" Rua Williams and J. Gilbert in *Diversity, Inclusion, and Social Justice in Human Systems Engineering*. Human Factors and Ergonomics Society.
  - Williams, RM and Gilbert, j - 2019 Nothing About US Without Us.pdf
- "Heavenly Bodies: Why It Matters That Cyborgs Have Always Been About Disability, Mental Health, and Marginalization" Damien P. Williams, 2019.
  - https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3401342.

## *Week 15: Writing, Discussion, and meeting week*