

University of Calgary
Department of Communication, Media and Film
Communication and Media Studies COMS 591 S02
Senior Seminar in COMS (Seminar): GENOMIC MEDIA
WINTER 2019

Th 2:00PM - 4:45PM
Jan 10, 2019-Apr 12, 2019 (excluding Feb. 21st)

Instructor: Dr. Hogan
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Office Phone: 220-3248
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Web Page: D2L available through MyUofC portal
Office Hours: 12:00 to 1:00 Thursdays or by appointment

Course Description

This course is a senior seminar that looks at the intersection of genomics and media. We look at two main topics: how synthetic DNA is used to store media (video, text, operating systems, computer viruses, etc) and how genomics data is stored in the cloud. Through these topics, we will explore questions of gender, sexuality, race, class, and ability ever present in the algorithms, artificial intelligence, science labs, and infrastructures that undergird genomics as a rapidly expanding field of research.

Objectives of the Course

- to demonstrate an ability to read and interpret texts in the field
- to describe how communication plays a significant role in the framing and discussion of genomics and genomic media
- to survey and compare a wide variety of media (podcasts, print ads, documentaries, websites, etc) for the way they tell a story of and about the genes
- to produce written and oral discourse appropriate to the field
- to further develop your analytical, writing, and communication skills
- to work cooperatively in groups and become familiar with methods of peer evaluation

Textbooks and Readings

Readings are posted on the Desire2Learn (D2L) course website.

Internet and electronic communication device information

No cell phones allowed during class. If you'd like to take notes on an electronic device, bring in your laptop or tablet. Stay off Facebook and all social media, games, and texting, etc., during class. (You can check your cell phone during break, or step outside the class to make urgent calls.) For these reasons, and to help you be less distracted and retain more, you're strongly encouraged to take notes by hand!

Assignments and Evaluation

Weight	Course components	Due
30%	<u>Midterm paper:</u> <i>1000-1500 word reflection paper</i> You will look at a Genomics company (list of companies provided in class) and write an in-depth analysis of it using concepts learned in class. Be ready to discuss your findings in class.	Mar 14
40%	<u>Final paper:</u> <i>3000-3500 word final paper 30%</i> <i>presentation 10%</i> You will write a research paper that explores how Genomics data is stored in the cloud. You will look at one of the major players -- Amazon, Microsoft, Google -- and their involvement in supporting the Genomics industry worldwide.	Apr 11
30%	<u>Group Presentations</u> You will sign up for a group presentation based on one of the readings during the first week of class. You will be asked to do a 20 minute presentation and facilitate a 10 minute question and answer period relating to the presentation and theme of the week.	Ongoing

Registrar-scheduled Final Examination: No

You do not need to complete all assignments and exams in order to receive a passing grade in the course.

Submission of Assignments: Please hand in your essays directly to your instructor if possible [and upload to D2L when a DropBox is made available]. If it is not possible to do so, a daytime drop box is available in SS320; a date stamp is provided for your use. A night drop box is also available for after-hours submission. Assignments will be removed the following morning, stamped with the previous day's date, and placed in the instructor's mailbox.

Please include your name and ID number on all assignments, and be prepared to provide photo ID to pick up assignments or look at marked final exams in SS 320. Personal information is

collected in accordance with the *Freedom of Information and Protection of Privacy (FOIP) Act*. For more information, see <http://www.ucalgary.ca/legalservices/foip/foip-hia>

Note: It is the student's responsibility to keep a copy of each submitted assignment and to ensure that the proper version is submitted (particularly in courses requiring electronic submission). Including a version date in your file name may be useful.

Policy for Late Assignments

Assignments submitted after the deadline may be penalized with the loss of a grade (e.g.: A- to B+) for each day late.

Student Accommodations and Deferrals:

Students seeking an accommodation based on disability or medical concerns should contact Student Accessibility Services; SAS will process the request and issue letters of accommodation to instructors. For additional information on support services and accommodations for students with disabilities, visit www.ucalgary.ca/access/.

Students who require an accommodation in relation to their coursework based on a protected ground other than disability should communicate this need in writing to their Instructor. The full policy on Student Accommodations is available at <http://www.ucalgary.ca/policies/files/policies/student-accommodation-policy.pdf>.

Students seeking accommodation for transient illnesses (e.g., the flu) or for another legitimate reason should contact their instructors. Whenever possible, students should provide supporting documentation to support their request; however, instructors may not require that a medical note be presented. For the policy on supporting documentation the use of a statutory declaration, please see the following:

Section N.1 of the *University Calendar*: <https://www.ucalgary.ca/pubs/calendar/current/n-1.html>

FAQs for Students at <https://www.ucalgary.ca/registrar/registration/appeals/student-faq>

Note that when accommodations are granted, they may take forms other than make-up tests or assignments. For example, the weight of a missed grade may be added to that of another assignment or test.

For information on deferrals, see the following sections in the *University Calendar*:

Section G.7 Deferral of Term Work at <http://www.ucalgary.ca/pubs/calendar/current/g-7.html>

Section G.6 Deferral of Final Exam at <http://www.ucalgary.ca/pubs/calendar/current/g-6.html>

Grading & Department of Communication, Media and Film Grade Scale

Final grades are reported as letter grades. In this course, all components will be graded using letter grades. The following chart outlines the grade scale percentage equivalents used in the Department of Communication, Media and Film. In calculating final grades in this course, letter grades will be converted to the midpoint of the percentage range, as shown in the final column of the table below.

Grade Point Value	Description	Grade	Dept of CMF grade scale equivalents*	Letter grade % equivalent for calculations* **
4.00	Outstanding performance	A+	96 - 100%	98.0%
4.00	Excellent performance	A	90 - 95.99%	93.0%
3.70	Approaching excellent performance	A -	85 - 89.99%	87.5%
3.30	Exceeding good performance	B+	80 - 84.99%	82.5%
3.00	Good performance	B	75 - 79.99%	77.5%
2.70	Approaching good performance	B-	70 - 74.99%	72.5%
2.30	Exceeding satisfactory performance	C+	65 - 69.99%	67.5%
2.00	Satisfactory performance	C	60 - 64.99%	62.5%
1.70	Approaching satisfactory performance	C-	55 - 59.99%	57.5%
1.30	Marginal pass. Insufficient preparation for subsequent courses in the same subject	D+	53 - 54.99%	54.0%
1.00	Minimal pass. Insufficient preparation for subsequent courses in the same subject	D	50 - 52.99%	51.5%
0.00	Failure. Did not meet course requirements.	F	0 - 49.99%	0%

* If percentages are used to calculate final grades, then grades falling within these ranges will be translated to the corresponding letter grades.

** These percentage equivalents will be used for calculating final grades unless an alternative method of final grade calculation is outlined above.

Writing Skills Statement

Department policy directs that all written assignments (including, to a lesser extent, written exam responses) will be assessed at least partly on writing skills. Writing skills include not only surface correctness (grammar, punctuation, sentence structure, etc.) but also general clarity and organization. Sources used in research papers must be properly documented. If you need help with your writing, you may use the writing support services in the Student Success Centre (3rd floor, Taylor Family Digital Library). Visit the website for more details:

<http://www.ucalgary.ca/ssc/writing-support>

Plagiarism

Using any source whatsoever without clearly documenting it is a serious academic offense. Consequences include failure on the assignment, failure in the course and possibly suspension or expulsion from the university. You must document not only direct quotations but also paraphrases and ideas where they appear in your text. A reference list at the end is insufficient by itself. In-text citations must be provided, and readers must be able to tell exactly where your words and ideas end and other people's words and ideas begin. Wording taken directly from a source must be enclosed within quotation marks (or, for long quotations, presented in the format prescribed by the documentation style you are using). Paraphrased information must not follow the original wording and sentence structure with only slight word substitutions here and there. These requirements apply to all assignments and sources, including those in non-traditional formats such as Web pages or visual media.

For information on citation and documentation styles (including APA, Chicago, IEEE, MLA, and others), visit the links at <https://ucalgary.ca/ssc/resources/writing-support/436>. Research and citation resources are also available on the Purdue Online Writing Lab (OWL) website at <https://owl.english.purdue.edu/owl/section/2/> If you have questions about citing sources, please consult your instructor or visit the writing support services in the Student Success Centre (3rd floor, Taylor Family Digital Library, at <http://www.ucalgary.ca/ssc/writing-support>.

Academic Misconduct

For information on academic misconduct and its consequences, please see the *University of Calgary Calendar* at <http://www.ucalgary.ca/pubs/calendar/current/k.html>

Research Ethics

Whenever you perform research with human participants, including surveys, interviews, or observations, as part of your university studies, you are responsible for following university research ethics guidelines. Your instructor must review and approve your research plans and supervise your research. For more information about your research ethics responsibilities, see <http://arts.ucalgary.ca/research/resources/ethics>

Important information, services, and contacts for students

For information about . . .	Visit or contact . . .
ARTS PROGRAM ADVISING (ASC)	SS 102 403-220-3580 https://arts.ucalgary.ca/advising
<p>CAMPUS SECURITY & Safewalk Program</p> <ul style="list-style-type: none"> · Calgary Police Service · Emergency Text Messaging · Emergency Evacuation & Assembly 	<p>http://www.ucalgary.ca/security/ 403-220-5333</p> <p>403-266-1234 Emergency: call 911</p> <p>http://www.ucalgary.ca/emergencyplan/textmessage</p> <p>http://www.ucalgary.ca/emergencyplan/assemblypoints</p>
<p>DESIRE2LEARN (D2L) Support</p> <ul style="list-style-type: none"> · IT help line 	<p>http://elearn.ucalgary.ca/desire2learn/home/students</p> <p>403-220-5555 or itsupport@ucalgary.ca</p>
<p>STUDENT SUCCESS CENTRE</p> <ul style="list-style-type: none"> · Writing Support Services · Events & Info for Students 	<p>http://ucalgary.ca/ssc</p> <p>http://www.ucalgary.ca/ssc/writing-support</p> <p>http://ucalgary.ca/currentstudents</p>
<p>STUDENTS' UNION CONTACTS</p> <ul style="list-style-type: none"> · Faculty of Arts Reps · Student Ombuds 	<p>https://www.su.ucalgary.ca/about/who-we-are/elected-officials/</p> <p>http://www.ucalgary.ca/provost/students/ombuds</p>
<p>SU WELLNESS CENTRE</p> <ul style="list-style-type: none"> · Health Services · Mental Health Services · Distress entre 24/7 CRISIS LINE · Online resources and tips 	<p>403-210-9355 (MSC 370), M-F, 9:00–4:30 pm</p> <p>http://ucalgary.ca/wellnesscentre/health</p> <p>http://ucalgary.ca/wellnesscentre/counselling</p> <p>403-266-HELP (4357)</p> <p>http://ucalgary.ca/wellnesscentre/healthycampus</p> <p>If you're concerned about a friend or your own well-being, it is important to seek help early. Call or visit the SU Wellness Centre or the 24-hour crisis line.</p>

Schedule of Lecture Topics and Readings

JAN 10

Week 1: Intro to Genomic Media

Catherine Bliss (2018) "Chapter 1: Genes and their Environments" (pp.16-38) In *Social by Nature: The Promise and Peril of Sociogenomics*, Stanford University Press

Jeremy Freese (2018) "The Arrival of Social Science Genomics." *SocArXiv*. October 17.
doi:10.31235/osf.io/7qbjr <https://journals-sagepub-com.ezproxy.lib.ucalgary.ca/doi/full/10.1177/0094306118792214a>

Eugenics Archive: <http://eugenicsarchive.ca/discover/encyclopedia>

A Brief History: From Mendel to the HGP <https://unlockinglifescode.org/timeline>

JAN 17

Week 2: Life and The Human Genome Project

Kay, L (2000) Chapter 1 "The Genetic Code: Imaginaries and Practices" (pp 1-37) In: *Who Wrote the Book of Life: A History of the Genetic Code*

Keller, E F (2000) Chapter 2 "The Meaning of Gene Function: What Does a Gene Do?" (pp 45-72) In: *The Century of the Gene*

CASE: Pray, Leslie A. (2014) "Discovery of DNA Double Helix: Watson and Crick" in *Nature Education* 1(1):100. <https://www.nature.com/scitable/topicpage/discovery-of-dna-structure-and-function-watson-397>

Watch in class:

An Introduction to the Human Genome | HMX Genetics

https://www.youtube.com/watch?v=jEJp7B6u_dY

Human Genome Announcement at the White House (2000)

<https://youtu.be/slRyGLmt3qc>

Transcript: <https://www.genome.gov/10001356/>

The race to sequence the human genome - Tien Nguyen <https://www.youtube.com/watch?v=AhsIF-cmoQQ>

How to sequence the human genome - Mark J. Kiel

<https://www.youtube.com/watch?v=MvuYATh7Y74>

JAN 24

Week 3: Racial Science and Eugenics

Zimmer, C (2018) "Chapter 7: Individual Z" in *She Has Her Mother's Laugh: The Powers,*

Perversions and Potential of Heredity Picador Press, Uk.

TallBear, K (2013) "Racial Science, Blood and DNA" (pp 31-66) In: *Native American DNA: Tribal Belonging and the False Promise of Genetic Testing*

CASE: BuzzFeed Opinion (2018) "How Not To Talk About Race And Genetics"

<https://www.buzzfeednews.com/article/bfopinion/race-genetics-david-reich>

CASE: Listen: *Hidden Brain: Emma, Carrie, Vivian* <https://itunes.apple.com/ca/podcast/hidden-brain/id1028908750?mt=2&i=1000409675455> Episode 5

JAN 31

Week 4: Biocuration and Precision Medicine

Pierre-Gerlier Forest. "Una sanidad publica de precision: los datos y la modelizacion al servicio del progreso social." *Revista de Occidente*, no 446-447 (2018), 49-62. *in D2L (english)

Doug Howe et al. "Big data: The future of biocuration" *Nature*, 2008, Vol.455(7209), p.47

https://ucalgary-primo.hosted.exlibrisgroup.com/primo-explore/fulldisplay?docid=TN_nature_a10.1038/455047a&context=PC&vid=UCALGARY&search_scope=EVERYTHING&tab=everything&lang=en_US

Bliss, Catherine (2018) "Chapter 4: Determining Difference" in *Social by Nature: The Promise and Perils of Sociogenomics* Stanford University Press

FEB 7

Week 5: Genealogy Online

TallBear, K (2013) "Chapter 3: Genetic Genealogy Online" (pp 105-141) In: *Native American DNA: Tribal Belonging and the False Promise of Genetic Testing*

CASE: Elizabeth Warren releases results of DNA test

<https://www.bostonglobe.com/news/politics/2018/10/15/warren-addresses-native-american-issue/YEUaGzsefB0gPBe2AbmSVO/story.html>

CASE: Future of Privacy Forum (FPF) (July 31, 2018) "Privacy Best Practices for Consumer Genetic Testing Services" <https://fpf.org/wp-content/uploads/2018/07/Privacy-Best-Practices-for-Consumer-Genetic-Testing-Services-FINAL.pdf>

CASE: <https://portswigger.net/daily-swigg/privacy-guidelines-launched-to-protect-dna-data>

Listen: *Good Life Project* "Your DNA May Not Be Your Destiny: Carl Zimmer"

<http://www.goodlifeproject.com/podcast/your-dna-may-not-be-your-destiny-carl-zimmer>

CASE: Are Genetic Testing Sites the New Social Networks?

<https://www.nytimes.com/2018/06/16/style/23-and-me-ancestry-dna.html>

FEB 14

Week 6: CRISPR and Synthetic Life

Jennifer Doudna & S Sternberg "The Reckoning" (pp 184-212) In: *A Crack in Creation: Gene Editing and the Unthinkable Power to Control Evolution*

Roosth, S (2017) "Life by Design: Evolution and Creation Tales of Synthetic Biology" (pp 21-48) In: *Synthetic: How life Got Made*

CASE: Using Harpoon-Like Appendages, Bacteria 'Fish' for New DNA
<https://www.nytimes.com/2018/06/14/science/bacteria-harpoons-dna.html>

FEB 28

Week 7: The Postgenomic Condition

Reardon, J (2018) "Chapter 6: Genomics for the 98%" (pp 120-144) in *The Postgenomic Condition* University of Chicago Press

Mukherjee, S (2016) "The future of the future" (pp 417-483) In: *The Gene: An intimate History*

Nelson, A "Racial Politics After the Genome" (pp 157-166) In: *The Social Life of DNA: Race, Reparations, and Reconciliation After the Genome*

MAR 7

Week 8: Genomics in the Cloud

Reardon, J (2016) "The Genomic Open" Issue 6 The Total Archive (March)
<https://limn.it/articles/the-genomic-open/>

Reardon, J (2018) "Chapter 2: The Information of Life of the Life of Information?" (25-45) in *The Postgenomic Condition* University of Chicago Press

<https://www.nanalyze.com/2018/09/dna-data-storage-companies/>

MAR 14 - SCMS

Week 9: MIDTERM

MAR 21 - Carleton

Week 10: Storing Media onto DNA

Mél Hogan Uncertain Archive

CASE: DNA data storage could solve a big problem

<https://www.cnet.com/videos/dna-data-storage-could-solve-a-big-problem/>

CASE: Molteni, M (Jul 12, 2018) "The Rise of DNA Data Storage" <https://medium.com/@WIRED/the-rise-of-dna-data-storage-284da9d062cd>

CASE: Johnson, B (Jul 10, 2018) "Beyond the Hard Drive: Encoding Data in DNA"

<https://medium.com/future-literacy/beyond-the-hard-drive-encoding-data-in-dna-1d5c2bad5289>

CASE: Gabbatiss, J (May 25, 2018) "DNA shape changed by scientists to create tiny machines and computers" *Independent UK* <https://www.independent.co.uk/news/science/dna-shape-computers-machines-nanotechnology-triggers-uea-a8369801.html>

CASE: Walsh, B (April 6, 2018) "This company can encode your favorite song in DNA—for \$100,000"

<https://www.technologyreview.com/s/610717/this-company-can-encode-your-favorite-song-in-dnafor-100000/>

CASE: Offord, C (October 1, 2017) "Making DNA Data Storage a Reality" *The Scientist* <https://www.the-scientist.com/?articles.view/articleNo/50406/title/Making-DNA-Data-Storage-a-Reality/>

CASE: Sample, I (July 13, 2017) "Harvard Scientists Pioneer Storage of Video inside DNA." *The Guardian* <http://www.theguardian.com/science/2017/jul/12/scientists-pioneer-a-new-revolution-in-biology-by-embedding-film-on-dna>

CASE: Young, E (July 12, 2017) "Scientists Can Use CRISPR to Store Images and Movies in Bacteria" *The Atlantic*

<https://www.theatlantic.com/science/archive/2017/07/scientists-can-use-crispr-to-store-images-and-movies-in-bacteria/533400>

MAR 28

Week 11:

Apr 4

Week 12: DNA Controversies

CASE: Gay gene: David Miller (1995) "Introducing the 'gay gene': media and scientific representations"

Public Understanding of Science Vol 4, Issue 3, 1995

<http://journals.sagepub.com.ezproxy.lib.ucalgary.ca/doi/pdf/10.1088/0963-6625/4/3/005>

CASE: Epigenetics: Bruce Lipton - Biology of Belief <https://londonreal.tv/e/bruce-lipton/>

(or) <https://youtu.be/GCG1zj3mxOw>

CASE: Zimmer, C (May 21, 2018) "Every Cell in Your Body Has the Same DNA. Except It Doesn't."
<https://www.nytimes.com/2018/05/21/science/mosaicism-dna-genome-cancer.html>

Apr 12 - presentations

Week 13: Summary and exit

Forensic DNA

CASE: Your DNA Is Out There. Do You Want Law Enforcement Using It?

<https://www.bloomberg.com/news/features/2018-10-27/your-dna-is-out-there-do-you-want-law-enforcement-using-it>

CASE: DNA TESTING MIGHT HELP REUNITE FAMILIES SEPARATED BY TRUMP. BUT IT COULD CREATE A PRIVACY NIGHTMARE. <https://theintercept.com/2018/06/27/immigration-families-dna-testing/>

CASE: How a Genealogy Site Led to the Front Door of the Golden State Killer Suspect

<https://mobile.nytimes.com/2018/04/26/us/golden-state-killer.html#click=https://t.co/9bge8cOh1c>