Term Information

Effective Term   Spring 2022

General Information

Course Bulletin Listing/Subject Area   Anthropology
Fiscal Unit/Academic Org   Anthropology - D0711
College/Academic Group   Arts and Sciences
Level/Career   Graduate
Course Number/Catalog   7100
Course Title   Core Concepts in Computational Social Sciences
Transcript Abbreviation   Comp Soc Sci
Course Description   Introduction to computational social science. Through seminars and workshops, students are introduced to theory-guided data science, practical applications, and the professional ethics of this interdisciplinary field. Extensive experience with programming will be helpful but is not required. Please contact the instructor with any questions.
Semester Credit Hours/Units   Fixed: 3

Offering Information

Length Of Course   14 Week
Flexibly Scheduled Course   Never
Does any section of this course have a distance education component?   No
Grading Basis   Letter Grade
Repeatable   No
Course Components   Seminar, Workshop
Grade Roster Component   Seminar
Credit Available by Exam   No
Admission Condition Course   No
Off Campus   Never
Campus of Offering   Columbus

Prerequisites and Exclusions

Prerequisites/Corequisites
Exclusions
Electronically Enforced   No

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code   45.0201
Subsidy Level   Doctoral Course
Intended Rank   Masters, Doctoral

Requirement/Elective Designation

The course is an elective (for this or other units) or is a service course for other units

Course Details

Course goals or learning objectives/outcomes	• Develop appreciation for and familiarity with computational modeling techniques in theory-based analysis of social systems.
	• Develop appreciation for the unique ethical considerations that follow from CSS approaches and learn how to conduct moral and ethical CSS research.
	• Develop the ability to apply a CSS approach to solve theoretical and applied research problems in the social sciences.
	• Discover methods for investigating social research questions such as data analytics, agent-based modeling, simulation, and high-performance computing.
	• Develop collaborative skills to work with specialists in the social and computer sciences, including identifying collaborators, building rapport and teamwork.
Content Topic List	• Algorithms
	• Ethics
	• Data Science
	• Text Mining
	• Artificial Intelligence
	• Machine Learning
	• Social Theory
Sought Concurrence	No

Attachments

• ANTHROP 7100 CSS Syllabus.docx: Syllabus

(Syllabus. Owner: Healy,Elizabeth Ann)

Comments

• It is not clear why this course and the 4000-level course are not offered under one 5000-level course. That is why the university has 5000-level courses. *(by Vankeerbergen,Bernadette Chantal on 04/01/2021 04:13 PM)*

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Healy,Elizabeth Ann	03/30/2021 05:25 PM	Submitted for Approval
Approved	Guatelli-Steinberg,Debra	03/30/2021 08:09 PM	Unit Approval
Revision Requested	Vankeerbergen,Bernadette Chantal	04/01/2021 04:14 PM	College Approval
Submitted	Guatelli-Steinberg,Debra	04/01/2021 04:15 PM	Submitted for Approval
Approved	Guatelli-Steinberg,Debra	04/07/2021 12:10 PM	Unit Approval
Approved	Vankeerbergen,Bernadette Chantal	04/22/2021 10:49 AM	College Approval
Pending Approval	Jenkins,Mary Ellen Bigler Hanlin,Deborah Kay Oldroyd,Shelby Quinn Hilty,Michael Vankeerbergen,Bernadette Chantal	04/22/2021 10:49 AM	ASCCAO Approval

Proposed course title: Core Concepts in Computational Social Sciences

Proposed course number: ANTHROP 7100

Instructor: Dr. Sean Downey (Anthropology, Sustainability Institute & TDAI)
Email: downey.205@osu.edu

Phone: 614-688-3904
Office: 4034 Smith Labs

Course Description

This course is designed to change the way students think about social science research. It will provide graduate students with an introduction to the interdisciplinary field of computational social science (CSS). The course has two audiences: social scientists who have training in studying human behavior, but who are less familiar with computational methods; and data scientists who are adept with the tools of the digital age but who are new to studying human behavior. The course will survey some of the most remarkable insights and discoveries across the computational social sciences in order to inspire the next generation of undergraduate and graduate students in this interdisciplinary field. The course will highlight CSS studies with practical applications for society and business and highlight the important of theory-guided data science for providing important theoretical insights into the behavior of human social systems. Over the semester, students will gain an appreciation for the types of questions in the social sciences that computational methods have be used to address and develop the ability to conceive of computational social science methodologies of their own.

Course goals

1. Develop appreciation for and familiarity with computational modeling techniques in theory-based analysis of social systems.
2. Develop appreciation for the unique ethical considerations that follow from CSS approaches and learn how to conduct moral and ethical CSS research.
3. Develop the ability to apply a CSS approach to solve theoretical and applied research problems in the social sciences.
4. Discover methods for investigating social research questions such as data analytics, agent-based modeling, simulation, and high-performance computing.
5. Develop collaborative skills to work with specialists in the social and computer sciences, including identifying collaborators, building rapport and teamwork.

Credit hours and work expectations

This is a 3-credit-hour course. According to Ohio State policy, students should expect around 3 hours per week of time spent on direct instruction (instructor content and Carmen activities, for example) in addition to 6 hours of homework (reading and assignment preparation, for example).

Prerequisites

CSS is inherently interdisciplinary field of study and this course is intended to be accessible to graduate students from diverse disciplines. As an introductory course in CSS, it is intended to inspire and engage students to further study, I encourage participation from students with preparation the following areas, though others may apply:

- Students in the social sciences who are eager to learn about coding, big-data analytics, and computer modeling.
- Students from the data or computer sciences with background in coding, math, and modeling from computer science who are eager to learn about social science research design and theory-driven modeling.

The course works best when students with both types of background enroll because it will also provide opportunities for interdisciplinary collaboration.

However, given the diverse range of expertise students will come with, the course has no technical or social-science prerequisites. Nevertheless, to advance in CSS all students will be expected to develop expertise outside of their core aptitudes. The homework assignments and final project will provide opportunities to learn and practice these skills individually and in collaborative groups, and several technical workshops will be offered that provide exposure to key CSS technologies.

Technical Workshops

Four technical workshops will be included in the course by technical experts from the OSU Translational Data Analytics Institute and Ohio Supercomputer Center. The goal of these workshops is to provide students with exposure and hands-on experience with a number of tools that are used in CSS research. The goal is not to master these tools, but to gain exposure to methods of analysis, facilitate interdisciplinary communication, and guide CSS research design. Students who do have technical skills are encouraged to exercise them to their fullest ability; students with less technical aptitude will benefit by learning about different approaches, which will facilitate interdisciplinary collaboration, and guide future areas of study.

Schedule of activities

Class will meet once per week on Mondays for 2 hours and 50 minutes. Having a single large block of time will allow for detailed discussions, hands-on activities, and technical workshops.

Required Book

Salganik, Matthew J. 2019. Bit by bit: Social research in the digital age. Princeton University Press [MJS]. Student cost $25; also, freely available from the author's website.

Office hours

Office hours are optional, but I do encourage you to find time to meet with me this semester, especially if you ever have any questions about the course or its materials.

Course Requirements & Grading

Grades will be based on the following:

Assignment	Percent of final grade
1. Participation (Discussion leader)	10%
2. Homework activities, Easy/Medium (10)	10%
3. Homework activities, Hard/Very hard (2)	10%
4. Project proposal (Team leaders)	20%

5. Paper draft + peer reviews (2)	10%	
6. Final paper	40%	
Total	**100%**	

Final grades are based on the OSU Standard Scheme: A 93+; A- 90-92; B+ 87-89; B 83-86; B- 80-82; C+ 77-79; C 73-76; C- 70-72; D+ 67-69; D 60-66; E< 60.

1. Participation

Participation in class discussion is an essential aspect of this course and attendance is mandatory. Your contribution of pithy questions and participation in discussions are essential. Each week, one or more students will be assigned the role of discussion leader(s) for both classes covering that week's readings. ***Leading one or more discussions is mandatory for graduate students.*** How you choose to fulfill this role is up to you, but at the very least you should prepare a brief spoken summary and a series of "talking points" related to the specific readings for the week.

2. Homework activities (Easy/Medium)

Each week you will complete a homework activity which will provide you experience working with some of the different datasets, tools, approaches, and ideas in we encounter throughout the course. Homework problems in the textbook are rated 1-4 (1=easy, 2=medium, 3=hard, and 4=very hard), and they are classified with respect to the skills required to complete them (math, coding, data collection). Easy and Medium problems typically focus on CSS research design, ethics, and interdisciplinary collaboration and student will be expected to complete these independently; hard and very hard problems typically research design, data collection and coding and typically require multiple skill sets spanning the data science / social sciences disciplinary boundary.

3. Homework activities (Hard/Very Hard)

Over the semester, students will be expected to form collaborative partnerships with other students to complete two hard or very hard problems during the weeks of their choice. Homeworks are due two weeks after they are assigned.

4. Project proposal

You will work in teams of two to develop a project proposal (1000-word maximum) which is <u>due during week five</u> of class. ***Graduate students are expected to take a "team leader" role on the proposal-writing team.*** Your proposal should address (1) what you will do; and (2) why we should care. The literature review should be minimally sufficient to explain the research question to a non-specialist and to address the questions stated above, and explanatory figures and graphs are encouraged. This proposal is an opportunity to get feedback on your topic. The following week (week 7), your group will 'pitch' the topic in class (10 minutes) and we will discuss the proposal and how it can be improved. You will be expected to address the of distribution of effort on your team.

5. Peer review

During <u>week 11</u> you will submit a draft of your final paper (3000-word maximum) for peer review. Please follow the general formatting guidelines for the funding agency of your choice. The final project must (1) specify a possible funding target (e.g., NSF GRFP or any other comparable granting agency in your field); (2) describe your project; (3) take one concrete step towards doing the research

(e.g., include a pilot analysis). This step could be things like acquiring, summarize, or simulating some data or running a pilot test of your survey on your friends. The goal here is not to do something perfect; it is to do something. The draft of your paper is not graded, but submission of a draft is required for full credit on the peer review exercise.

You will then write two peer reviews of the work submitted by your peers. You will spend a lot of your career giving feedback on people's ideas. The goal of your feedback is to be as helpful as possible to the author (not trying to make yourself look smart). In writing your feedback, it is useful to start by summarizing the goals of the proposal as clearly and succinctly as possible. Then describe what you liked about the proposal. Finally, you can make concrete suggestions about how the research described in the proposal can be improved.

6. **Final paper**

After incorporating feedback from the peer reviews you receive and revising, your final paper is due during finals week. The formatting guidelines are as described as above. In addition, please include a statement of contribution of effort.

Disability statement (with accommodations for COVID)

The university strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process (slds.osu.edu/covid-19-info/covid-related-accommodation-requests/), managed by Student Life Disability Services. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.

Excused absence guidelines (COVID)

Continuous engagement with this course is essential to learning the material. Students are expected to attend class and engage with assignments and discussion prompts for every scheduled meeting, participating at least once per week for courses with fully remote participation. Students who need to miss class or who are not able to participate due to illness (COVID-19 or other illnesses), exposure to COVID-19, care for family members exposed to COVID-19 or other reasons are expected to contact the instructor as soon as possible to arrange for accommodation. Students in special situations or those requiring specific, long-term or other accommodation should seek support from appropriate university offices including but not limited to: Student Advocacy, Student Life Disability Services and the Office of Institutional Equity.

Academic misconduct

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's Code of Student Conduct, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's Code of Student Conduct and this syllabus may constitute Academic Misconduct.

The Ohio State University's Code of Student Conduct (Section 3335-23-04) defines academic misconduct as: Any activity that tends to compromise the academic integrity of the University, or subvert the educational process. Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's Code of Student Conduct is never considered an excuse for academic misconduct, so I recommend that you review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Grievances and solving problems

According to University Policies, if you have a problem with this class, you should seek to resolve the grievance concerning a grade or academic practice by speaking first with the instructor or professor. Then, if necessary, take your case to the department chairperson, college dean or associate dean, and to the provost, in that order. Specific procedures are outlined in Faculty Rule 3335-7-23. Grievances against graduate, research, and teaching assistants should be submitted first to the supervising instructor, then to the chairperson of the assistant's department.

Creating an environment free from harassment, discrimination, and sexual misconduct

The Ohio State University is committed to building and maintaining a community to reflect diversity and to improve opportunities for all. All Buckeyes have the right to be free from harassment, discrimination, and sexual misconduct. Ohio State does not discriminate on the basis of age, ancestry, color, disability, ethnicity, gender, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, pregnancy (childbirth, false pregnancy, termination of pregnancy, or recovery therefrom), race, religion, sex, sexual orientation, or protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment. Members of the university community also have the right to be free from all forms of sexual misconduct: sexual harassment, sexual assault, relationship violence, stalking, and sexual exploitation.

To report harassment, discrimination, sexual misconduct, or retaliation and/or seek confidential and non-confidential resources and supportive measures, contact the Office of Institutional Equity:

6. Online reporting form at equity.osu.edu,
7. Call 614-247-5838 or TTY 614-688-8605,
8. Or Email equity@osu.edu

The university is committed to stopping sexual misconduct, preventing its recurrence, eliminating any hostile environment, and remedying its discriminatory effects. All university employees have reporting responsibilities to the Office of Institutional Equity to ensure the university can take appropriate action:

- All university employees, except those exempted by legal privilege of confidentiality or expressly identified as a confidential reporter, have an obligation to report incidents of sexual assault immediately.
- The following employees have an obligation to report all other forms of sexual misconduct as soon as practicable but at most within five workdays of becoming aware of such information: 1. Any human resource professional (HRP); 2. Anyone who supervises faculty, staff, students, or volunteers; 3. Chair/director; and 4. Faculty member.

Diversity statement

The Ohio State University affirms the importance and value of diversity of people and ideas. We believe in creating equitable research opportunities for all students and to providing programs and curricula that allow our students to understand critical societal challenges from diverse perspectives and aspire to use research to promote sustainable solutions for all. We are committed to maintaining an inclusive community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among all members; and encourages each individual to strive to reach their own potential. The Ohio State University does not discriminate on the basis of age, ancestry, color, disability, gender identity or expression, genetic information, HIV/AIDS status, military status, national origin, race, religion, sex, gender, sexual orientation, pregnancy, protected veteran status, or any other bases under the law, in its activities, academic programs, admission, and employment.

To learn more about diversity, equity, and inclusion and for opportunities to get involved, please visit:

- https://odi.osu.edu/
- https://odi.osu.edu/racial-justice-resources
- https://odi.osu.edu/focus-on-racial-justice
- http://mcc.osu.edu/

Mental health statement

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life Counseling and Consultation Services (CCS) by visiting ccs.osu.edu or calling (614) 292- 5766. CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on-call counselor when CCS is closed at (614) 292-5766 and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1-(800)-273-TALK or at suicidepreventionlifeline.org

Content warning

Some content in this course may involve media that may elicit a traumatic response in some students due to descriptions of and/or scenes depicting acts of violence, acts of war, or sexual violence and its aftermath. If needed, please take care of yourself while watching/reading this material (leaving classroom to take a water/bathroom break, debriefing with a friend, contacting a confidential Sexual Violence Advocate 614-267-7020, or Counseling and Consultation Services at 614-292-5766 and contacting the instructor if needed). Expectations are that we all will be respectful of our classmates while consuming this media and that we will create a safe space for each other. Failure to show respect to each other may result in dismissal from the class.

Lyft Ride smart

Lyft Ride Smart at Ohio State (https://ttm.osu.edu/ride-smart) offers eligible students discounted rides, inside the university-designated service area, from 9 p.m. to 3 a.m. Each month, 10,000 discounted rides will be made available on a first-come, first-served basis with the average cost expected to be $2 or less. Prices may be impacted by distance, traffic, time of day, special events and prime time surcharges. To qualify for program discounts, users must select "shared ride" when booking in the Lyft app. When using ride sharing, remember to visually confirm vehicle info/descriptions in the company app and ask the driver to say who they are picking up.

In-completes

In-completes should be reserved for extreme emergencies that prevent the completion of course assignments toward the end of a school semester. It is very difficult to make up course assignments from a previous semester once a new semester begins, and students are often not able to prevent an Incomplete grade from lapsing into an F before the assigned deadline. If you think it is necessary to apply for an Incomplete grade due to an end of semester emergency, please contact the instructor immediately to arrange for a new submission date for the incomplete work and to fill out the proper paperwork. The instructor reserves the right to refuse an Incomplete grade to any student.

Late assignments

Late assignments will only be accepted under extreme circumstances, and if accepted, points may be deducted depending on the circumstances. Always alert the instructor ahead of time if you think that you may not be able to submit an assignment on time.

Religious Observance

Effort will be made to avoid scheduling assignments with major religious holidays that are observed by OSU. However, it is the student's responsibility to inform the instructor of any intended absences for religious observances in advance. Prior notification is especially important in connection with final examinations.

Copyright

All course materials (presentations, exams, handouts, labs, etc. in digital or paper format) are subject to copyright protection and may only be used for personal use. Course materials may not be distributed without permission of the instructor.

Acknowledgements

Course topics and Schedule

Week 1: Introduction and Logistics

Readings: MJS: Preface, Chap. 1; Lazer 2009; Lazer 2020; Buyalskaya et al. 2021

Week 2: Ethics

Readings: MJS, Chap. 6; Edelmann et al. 2020; Mann 2016

Homework 1: 1 easy and 1 medium question

Week 3: Observing Behavior

Readings: MJS, Chap. 2; Barton 2013; Conte 2012

Homework 2: 1 easy and 1 medium question

Week 4: *Technical Workshop I: Reproducible CSS (tools, markdown, workflow, etc.)(TDAI)*

TBD

Week 5: Asking questions

Readings: MJS Chap. 3; Maxwell, 2018; Karpatne 2018

Homework 3: 1 easy and 1 medium question

Project proposal due

Week 6: Student project pitch workshop

Week 7: *Technical Workshop II: Data Visualization (TDAI)*

Readings: selections from Healy 2013

Week 8: Running Experiments

Readings: MJS Chap. 4; Centola, 2010

Homework 4: 1 easy and 1 medium question

Project presentations

Week 9: *Technical Workshop III: Text mining (TDAI)*

TBD

Week 10: Creating mass collaborations

Reading: MJS Chap. 5

Homework 5: 1 easy and 1 medium question

Week 11: *Collaboration workshop: Student projects*

This week in-class time will be dedicated to collaborative group work by student project teams.

Student final paper draft due

Week 12: *Technical Workshop IV: High performance computing (Ohio Supercomputer Center)*

TBD

Peer reviews due

Week 13: The future of CSS

Reading: MJS Chap. 7

Homework 6: 1 easy and 1 medium question

Week 14: Student team presentations

Exam Week: Final paper is due

Assigned Readings

Buyalskaya, Anastasia, Marcos Gallo, and Colin F. Camerer. "The golden age of social science." *Proceedings of the National Academy of Sciences* 118.5 (2021).

Edelmann, Achim, et al. "Computational social science and sociology." *Annual Review of Sociology* 46 (2020): 61-81.

Barton, C. M. "Stories of the past or science of the future? Archaeology and computational social science." *Computational approaches to archaeological spaces* (2013): 151-178.

Conte, R., et al. "Manifesto of computational social science." *The European Physical Journal Special Topics*, 214(1) (2012)" 325-346.

Centola, D. 2010. "The Spread of Behavior in an Online Social Network Experiment." Science 329(5996): 1194–97.

Healy, Kieran. Data visualization: a practical introduction. Princeton University Press, 2018.

Karpatne, Anuj, et al. "Theory-guided data science: A new paradigm for scientific discovery from data." IEEE Transactions on knowledge and data engineering 29.10 (2017): 2318-2331.

Lazer, David MJ, et al. "Computational social science: Obstacles and opportunities." Science 369.6507 (2020): 1060-1062.

Lazer, D., et al. "Computational Social Science." *Science*, 323 (2009): 721-723.

Mann, Adam. "Core concept: Computational social science." *Proceedings of the National Academy of Sciences* 113.3 (2016): 468-470.

Maxwell, Kate, and Paul Benneworth. "The construction of new scientific norms for solving Grand Challenges." *Palgrave Communications* 4.1 (2018): 1-11.