

## PBHL 3999 – Diffusion: How things Spread

Spring 2020, North Classroom 3112, Tues & Thurs 9:30-10:45

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### Course Description

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How do infectious diseases spread through a population? How do novel ideas become popular, or fade away? How do we learn the behaviors we engage in? This class will investigate the various ways that these types of things spread through a population. We will explore the similarities and differences between things like infectious diseases, ideas and behaviors in the ways they spread.

### Objectives

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- Differentiate between simple and complex models of contagion.
- Identify why diseases, ideas, and behaviors (and other “bits”) differ in the ways they diffuse.
- Describe the basic stages of a diffusion curve.
- Apply select network models of diffusion (density, centrality, etc.) to account for diffusion success/failure and speed.

### Assigned Readings

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All required readings and supplemental materials will be available via Canvas.

### Course Structure & Requirements

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First and foremost, this course will be organized as a seminar. *This means that you will need to come to each class session having completed assigned readings and prepared to discuss the day’s topic* from the various perspectives pertinent to understanding, explaining and seeking to improve these public health issues. Much of our reading for this course will be primary peer-reviewed research articles. At times the content of these will be over your head. This is to be expected. Your aim will not be to fully interpret the minutiae of every aspect of these readings, but to extract the key dimension(s) of public health they bring to bear on the topic at hand, and use those ideas to help the class formulate an informed discussion. I will provide guidance on strategies for how to optimize your reading for this class, particularly on how to extract key ideas from articles used for different aims in the course.

### Requirements

#### I – Participation Elements

##### A. Active in-class participation (25 points, 5% of total grade)

This entails showing up for class sessions on time, ready to discuss the day’s material, including assigned readings. You should be actively engaged in discussions (using devices only for class-relevant activity) and activities.

##### B. Periodic in-class activities (100 points max, 20% of the total)

We will regularly have in-class brief written assignments. Sometimes this will entail turning in a reading summary. Other times we will have activities in-class with elements graded only for completion. No more than 100 accumulated points will be applied to your final grade.

## II – Homework Assignments

More details are provided in separate handouts for each of these assignments.

### A. Article Summary (50 points, 10% of total grade)

Each student will individually present to the class a summary of a primary research article on a topic of their choosing. These presentations will be 7-10 minutes, and presentation style is up to the student.

### B. Infographic (55 points, 11% of total grade)

Individually, or in teams of 2-3, you will produce an infographic addressing (at least) 4 key elements of a single behavior/attitude/health outcome pertinent to the topic of diffusion. If you choose to do this assignment as a group, all group members will receive the same grade.

### C. Podcast or Video (70 points, 14% of total grade)

Individually, or in teams of 2-3, you will produce a podcast or video of 8-10 minutes highlighting the importance of a single behavior/attitude/health outcome pertinent to the topic of diffusion. If you choose to do this assignment as a group, all group members will receive the same grade.

## III – Exams (200 points, 40% of total grade):

### A. Mid-term Exam (100 points, 20% of total grade)

All material covered up to the class period preceding the mid-term is fair game for this exam. It will consist of a mix of multiple choice, short answer, and essay questions. Exams will be conducted in class.

### B. Second Exam (100 points, 20% of total grade)

The second exam is not comprehensive, and will focus primarily on material covered since the mid-term. However, some material in this course will build on itself over time, and that “aggregation” of knowledge is fair game if it carries over. We may also revisit any poorly understood concepts from the first half of the course if necessary, making them also appropriate as exam material. The second exam is scheduled for our assigned final exam slot.

## Grading

### Maximum Potential Points (500):

<u>Participation (25%, 125 points)</u>	<u>Assignments (35%, 175 points)</u>	<u>Exams (40%, 200 points)</u>
Active engagement (25 points)	Article Summary (50 points)	Exam 1 (100 points)
In-class activities ( <i>up to</i> 100 pts)	Infographic (55 points)	Exam 2 (100 points)
	Podcast/Video (70 points)	

### Final Grade Computation:

Your final grade will be determined by summing the number of points earned from each of the above categories. Letter grades will be determined from your point total as follows:

<u>Letter Grade</u>	<u>Points Range</u>	<u>Letter Grade</u>	<u>Points Range</u>	<u>Letter Grade</u>	<u>Points Range</u>
A	468+	B	412-437	C	362-387
A-	450-467	B-	400-411	C-	350-361
B+	438-449	C+	388-399	D	300-349

Any student accumulating 299 or fewer points will receive an F for the course.

### Grading Expectations:

Participation, presentation, and paper grades you earn will reflect how thoroughly your work demonstrates the particular assignment requirements *and* overall course aims, which will correspond to the following sets of expectations:

- F Work that **fails to address** an assignment's **minimum requirements** will earn grades in the F range.
- D Work that **incompletely addresses** an assignment's **minimum requirements** will earn grades in the D range.
- C Work that **addresses only** an assignment's **minimum requirements** will earn grades in the C range.
- B Work that, **in addition to** meeting an assignment's **minimum requirements**, also **occasionally** reflects **engagement** with other material from the course where appropriate, in ways that **meet course objectives** will earn grades in the B range.
- A Work that, **in addition to** meeting an assignment's **minimum requirements**, also **consistently** reflects **engagement** with other material from the course where appropriate & in ways that **exceed course objectives** will earn grades in the A range.

Please note now that there are NO extra credit opportunities in this course. For this course to be successful, and therefore for you to be successful in this course, we need everyone keeping up with requirements throughout the semester.

### Course Expectations

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#### What I expect from you:

**1 – Make a concerted effort to bring the best you can to the course.** This means doing readings before class, bringing materials you need to actively participate in class sessions, putting forth effort into the evaluated elements of the course. It also means taking ownership over the grades you earn.

**2 – Treat others in the class with respect.** This includes simple norms of regular interaction (listening when others are speaking, giving due attention to other's when presenting you would expect in return, etc.) and thoughtfully considering the contributions of others. At times we'll potentially cover material of a sensitive nature; being able to respect other's expressed opinions makes critical discourse possible.

#### What you can expect from me:

**1 – Make a concerted effort to bring the best I can to the course.** This means leading a class appropriate to its level, selecting "up to date" material that helps illustrate the course's key aims, regularly being available for interaction within and (to a reasonable extent) outside the classroom, and adapting as is appropriate for the needs of the class.

**2 – Treat others in the class with respect.** This includes being prepared for class, returning graded materials in a timely manner with useful feedback, being impartial in the assessment of student work, while holding it to the standards of the course and college. It also means fostering an environment where diverse perspectives can comfortably be shared in class.

#### What we all can expect from each other:

*Behave in a manner reflecting common courtesies.* Show up to class on time; don't leave early. If something arises, and you need to leave class, do so in a way that minimizes distractions to others. Show up to office hours or other appointments as scheduled. Maintain professionalism in all electronic communication (e.g., email/Canvas messages). Use laptops/tablets **for class purposes only** (e.g., to access readings or take notes). Any other uses will lead you to lose this privilege. All other devices (phones, etc.) should be silenced for the duration of class.

#### Due Dates & Late Assignments:

- Infographic & Podcast/Video Assignments are due to Canvas by **midnight, on their specified due dates**. If late, they will be deducted 25% if they are 5 minutes to 24 hours late, 50% if 24-48 hours late, and will not be accepted if more than 48 hours late.

- Article Summaries are in-class presentations. These cannot be rescheduled within a week of the assigned presentation slot without an excused absence.
- In-class Activities are due at the time they are collected in class. No makeup opportunities are made for In-Class Activities, because I will provide enough opportunities for these in class, so that up to three could be missed and full credit still achieved.
- Exams are administered in class on the specified dates. For an excused absence resulting in you missing an exam, communicate the reason for your absence within one day of the missed exam, and we will make accommodations for a makeup exam. Unexcused absences will result in a zero on the missed exam.

### Course Communication:

- The Syllabus has answers to the most common questions pertaining to the course. Be sure check the syllabus first, before asking me about due-dates, assignment requirements, etc.
- Office Hours are available to add to your experience in this course. **Please make use of them.** These are meant to supplement required course work and in-class elements. As such, while I am happy to discuss course materials or other aspects of public health/academia in general with you during this time, they should not be viewed as an opportunity to ask, "What did I miss in class?" (You should find peers in the class with whom you can share notes for that purpose.)
- Canvas will be used for the majority of communication in this course. You can find a copy of the syllabus, additional assigned readings, and all assignments there. I will also post any lecture notes after each class. To make your experience in this course successful, you should expect to make this resource a *regular* part of your preparation for this course.
- E-mail should be used for quick communications (things that can be responded to in no more than a few sentences); use office hours for anything requiring more depth. You should only use your UCD email account for communication related to this course; I will not read/reply to emails from your personal accounts (e.g., Yahoo!, Hotmail, etc). Please consider e-mail as subject to the same standards of communication as you would all other forms written material in this course (i.e., you should use complete sentences, proper punctuation, etc.). I will typically respond to email within **48 hours**. I will **NOT, under any circumstances** discuss grades over email.

### University & CLAS Policies

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For relevant university deadlines and procedures & academic support services, visit:

[https://clas.ucdenver.edu/faculty-staff/sites/default/files/attached-files/student\\_services\\_and\\_calendar.pdf](https://clas.ucdenver.edu/faculty-staff/sites/default/files/attached-files/student_services_and_calendar.pdf)

**Academic Dishonesty (CLAS Academic Dishonesty Policy):** Students are required to know, understand, and comply with the CU Denver Academic Dishonesty Policy as detailed in the Catalog and on the CLAS website. A university's reputation is built on a standing tradition of excellence and scholastic integrity. As members of the University of Colorado Denver academic community, faculty and students accept the responsibility to maintain the highest standards of intellectual honesty and ethical conduct. Academic dishonesty consists of plagiarism, cheating, fabrication and falsification, multiple submission of the same work, misuse of academic materials, and complicity in academic dishonesty. If you are not familiar with the definitions of these offenses, go to <http://www.ucdenver.edu/academics/colleges/CLAS/faculty-staff/policies/HandlingAcademicDishonesty/Pages/Definition-of-Academic-Dishonesty.aspx>.

**Disability Services Information:** The University of Colorado Denver is committed to providing reasonable accommodation and access to programs and services to persons with disabilities. Students with disabilities who want academic accommodations must register with Disability Resources and Services (DRS) in Academic Building 1, #2116, Phone: 303-315-3510, Fax: 303-315-3515. Website:

<http://www.ucdenver.edu/student-services/resources/disability-resources-services/Pages/disability-resources-services.aspx>. I will be happy to provide approved accommodations, once you provide me with a copy of DRS's letter.

**Grades of Incomplete:** The current university policy concerning incomplete grades will be followed in this course. Incomplete grades are given only in situations where unexpected emergencies prevent a student from completing the course. Students have up to one year (three semesters) to complete course requirements. Dr. adams is the final authority on whether you qualify for an incomplete. Incomplete work must be finished within the time allowed or the "I" will automatically be recorded as an "F" on your transcript.

### Course Schedule Overview

Please note that this schedule is subject to change. Changes will be announced in class and on Canvas.

Date	Topic	Reading	Focus	Assignments Due
Jan 21	Introduction			
Jan 23	Overview	Gladwell 2000		
Jan 28	SEIR & $R_0$	Mishra et al 2011	M	
Jan 30	Measles	Rasmussen et al 2015	E	
Feb 4	Infectious Diseases	Friis & Sellers 2014	C	
Feb 6	HIV	Rothenberg et al 1998	E	
Feb 11	Variable Duration	Darbon et al 2019	C	
Feb 13	Vaccination & Herd Immunity	Anderson & May 1985	C	
Feb 18	Disrupting Flu	Salathé & Jones 2010	E	
Feb 20	Complex Contagions	Centola 2018	M	
Feb 25	Contraception	Valente et al 1997	E	
Feb 27	Beliefs & Misperceptions	Cowan 2014	C	
Mar 3	SARS "Scare"	Hooker 2008	E	
Mar 5	Exam 1			
Mar 10	Network Models	Kadushin 2012	M	
Mar 12	Concurrency	Morris 2007	E	
Mar 17	Innovations	Rogers 1995	C	
Mar 19	Tetracycline	Coleman et al 1957	E	Infographic (3/20)
Mar 23-27	No Class – Spring Break			
Mar 31	Critical Mass Models	Valente 1995	M	
Apr 2	Media & Small Groups	Katz & Lazarsfeld 1955	C	
Apr 7	Blacklists	Rossmann 2004	E	
Apr 9	Behavioral Influence	Brechwald & Prinstein 2011	C	
Apr 14	Opioids	de Vaan & Stuart 2019	E	
Apr 16	Health Lifestyles	adams et al 2020	E	
Apr 21	No Class Meeting – Group Workday			
Apr 23	Vector-Borne Diseases	IOM 2008	C	Podcast (4/24)
Apr 28	Chikungunya & Zika	Riou et al 2017	E	
Apr 30	Spatial & "Spatial" Models	González-Bailón 2017	M	
May 5	Cholera	Emch et al 2009	E	
May 7	Fake News	Grinberg et al 2019	E	
May 14	Exam 2			

**Full Reference Information for Required Readings**

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