

UNIVERSITY OF MICHIGAN MEDICAL SCHOOL DEPARTMENT OF LEARNING HEALTH SCIENCES

Health Infrastructure Pro Seminar 1
LHS 650
Fall 2023

CREDIT HOURS: 3

PRE-REQUISITES: Graduate standing or permission of instructor

FACULTY: Timothy A. Pletcher, DHA

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Office Hours by request plus some Wednesday nights at 8:30 PM EST via Zoom

COURSE DESCRIPTION

This course provides theoretical and practical perspectives on the evolution of major infrastructures, focusing in particular on health and information infrastructures. The course begins by examining how infrastructures emerge, evolve, and decay in the context of social systems. Students gain fluency in the language of infrastructure as a technological and social phenomenon linking people, processes, policy, and technology. The course focuses on the organization of health as a problem of infrastructure and considers how this perspective might inform research, practice, and the capacity for change.

COURSE OBJECTIVES

By completion of the course students will be able to:

- Evaluate a learning health system as an infrastructural construct.
- Categorize key conceptual and theoretical frameworks in infrastructural thinking in health and health information.
- Compare theoretical approaches in sociotechnical systems to problems of health and health information infrastructures.
- Apply theoretical approaches in sociotechnical systems to problems of health and health information infrastructures.
- Evaluate assumptions – including one's own – about the relationships between knowledge, technology, people, processes, and policy
- Evaluate approaches to designing and implementing infrastructure in health and health information systems.

CONTENT TOPICS

- Theory and science of infrastructure
- Dynamics of human vs. technology interplay to enable work
- Role of innovation vs. the constraints imposed by the installed base
- Interoperability as an enabler for the Learning Health System
- The differences between systems thinking and infrastructural thinking
- The layering and evolution over time of the health infrastructure

TEACHING METHODS

This is an online course, which will be delivered via Canvas. It is also your learning environment, where you will interact with a community of your classmates and the instructors. Within the course Canvas site, you will access the learning materials and syllabus, discuss issues, submit assignments, take exams, email other students and the instructors, participate in online activities including small groups, and display your projects.

This course will be taught using multiple methods, including, but not limited to: *discussions, mini-lectures, group work, case study analyses, videos, web-based technologies, and hands-on programming.*

The first half of the semester will be focused around infrastructure leading into defining health infrastructure. The second half of the semester will examine the role of interoperability in defining a learning health system and the application of infrastructural inversion techniques to examine how health infrastructure evolves.

REQUIRED TEXTS AND OTHER MATERIALS

1. No required textbook

Additional readings: This course will utilize assigned readings including journal articles and book chapters, as well as government publications. All resources are available through the University of Michigan Library or through direct link to the resource.

Expectations

This is a small class; therefore, discussions will be the key to learning during the course. There will be readings from provided sources that will prepare the student for discussions during class. Much of activity will be focused on problem solving; therefore, students will focus on difficult scenarios and questions that present challenging approaches. Students will also apply concepts to their own research ideas. Students are expected to be active contributors within their groups, maintaining a scholarly tone in all discussions, essays and exercises.

COURSE POLICIES

Accessibility and Accommodations

Students should speak with their instructors before or during the first week of classes regarding any special needs. Students seeking academic accommodations should register with Services for Students with Disabilities (SSD). SSD arranges reasonable and appropriate academic accommodations for students with disabilities. Please visit <https://ssd.umich.edu>

GRADING AND EVALUATION

Grading will be based on seven evaluation methods. They are detailed below:

- A. Weekly Discussions-Whole Class-10 pts each (120 pts total)**
- B. Weekly Discussions-Mixed Media Class-10 pts each (110 pts total)**
- C. Four written paper assignments-100 pts each (400 pts total)**
- D. Two Knowledge Check quizzes-25 pts each (50 pts total)**
- E. Infrastructural Inversion 1-(100 pts total)**
- F. Infrastructural Inversion 2-(50 pts total)**
- G. Final Paper-(200 pts total)**

GRADING POLICIES

No late assignments will be accepted without penalty. Unless an agreement has been reached in advance with the instructor, the student will lose 10% for each day that the assignment is late. For example, if the assignment is worth 10 points and is turned in one day late, the maximum number of points for that assignment will be 9/10. Two days late will result in the maximum number of points being 8/10, and so on. **Graded assignments will be returned through Canvas.**

Final grades will be accessible through Wolverine Access; grades for each assignment will be posted through the Canvas course site. Overall course grades are posted within 72 hours of when the final course assignment component (typically the final paper) is due. The course grade will be a letter grade (A – D, F) following the weighting described below. Grades will be assigned using this conversion scale:

A+	97-100	B+	87-89	C+	77-79	D+	67-69	F	<60
A	93-96	B	83-86	C	73-76	D	63-66		
A-	90-92	B-	80-82	C-	70-72	D-	60-62		

DLHS Grade Grievance Policy

Regular feedback on graded assignments and timely resolution of any grading concerns is helpful for student learning and contributes to an overall positive experience. Students are encouraged to discuss any assignment grade concerns with the instructor(s) within two weeks of the grades being posted on Canvas. Similarly, any concerns and grievances related to the overall course grades should be raised by contacting the faculty of record within two weeks of the course grades being posted on Wolverine Access.

For this course, the grade dispute arbitration will happen within the Department of Learning Health Sciences (DLHS). After initial discussion with the faculty of record for the course, there is an opportunity for a second look by another DLHS faculty member with appropriate expertise for resolving grade disputes. If the student and faculty are not able to come to an agreement about the grade dispute, the Associate Chair for Educational Programs or assigned designee will adjudicate the dispute. Per Rackham's Academic Dispute Resolution Process, if the concern is not resolved, the student may seek a formal resolution conference with the Medical School's Rackham Resolution Officer (see <http://www.rackham.umich.edu/policies/academic-dispute-resolution> for full policy and the contact information for the current resolution officer.

Student Academic Dispute Procedures

Rackham's Academic Dispute Resolution Policy and Procedures are available to Rackham students who have a dispute or disagreement with faculty or staff about the equity and fairness of decisions or procedures that affect their academic standing, the conduct of their research, and progress toward the degree. Such issues may arise regarding fair and equal treatment in the conduct of a class, in the pursuit of the student's research, and in the grading or evaluation of academic work and research. Other issues may concern the equity and fairness of program, department, or Rackham policies. <https://rackham.umich.edu/academic-policies/section9/>

REMOTE LEARNING

While synchronous course instruction will be rare, there may be times when real-time discussion or small group meetings for assignments or group work may be needed. Instructors may also have office hours in real time as well.

The course will use Zoom for these synchronous ("real time") meetings. Meeting dates and times will be scheduled through [Canvas](#) and should appear on your calendar within Canvas. Please take the time to familiarize yourself with Zoom by visiting [U-M's Getting Started with Zoom](#) page. You may choose to use Zoom on your mobile device (phone or tablet).

This article describes how to update your name in Zoom:
<https://teamdynamix.umich.edu/TDClient/30/Portal/KB/ArticleDet?ID=746>
Some students and faculty may also wish to add their personal pronouns beside their names.

Things to Know About Zoom:

- You must sign in to my Zoom session using your uniquename and password (for med.umich.edu users: enter your Level 1 credentials).
- The Zoom sessions are recorded.
- Improper classroom behavior is not tolerated within Zoom sessions.
- You can contact [Information and Technology Services](#) if you have any technical issues accessing Zoom. You can also contact [Health Information Technology & Services](#) for help.

Digital Etiquette

Let's give our name when beginning to speak; Let's use the chat and/or raise hand feature if we're waiting to speak; Let's use microphones and mute when not actively speaking to improve overall audio and caption quality.

INSTITUTIONAL POLICIES

Academic Integrity of Students

The academic community, like all communities, functions best when its members treat one another with honesty, fairness, respect, and trust. Your instructors expect students to work and study together to foster learning and understanding of the material. However, direct copying of homework, copying of homework from existing solutions, cheating on an exam, and other conduct that violates the academic integrity and ethical standards of the Rackham Graduate School community cannot be tolerated and will result in serious consequences and disciplinary action.

All written submissions must be your own, original work. Original work for narrative questions is not mere paraphrasing of someone else's completed answer: you must not share written answers with each other at all. At most, you should be working from notes you took while participating in a study session. Largely duplicate copies of the same assignment will receive an equal division of the total point score from the one piece of work.

You may incorporate selected excerpts, statements, or phrases from publications by other authors, but they must be clearly marked as quotations and must be attributed. If you build on the ideas of prior authors, you must cite their work. You may obtain copy editing assistance, and you may discuss your ideas with others, but all substantive writing and ideas must be your own or be explicitly attributed to another.

If we suspect you have cheated (including plagiarism), at the very least you will receive a zero on the assignment. Rackham policy dictates that we must report every instance of academic dishonesty, no matter how small. Suspected academic misconduct will be handled by Drs. Piatt and Donnelly. <https://rackham.umich.edu/academic-policies/section8/>

Diversity, Equity, and Inclusion

The Department of Learning Health Sciences (DLHS) is committed to developing the institutional mechanisms and norms necessary to promote the values of diversity, equity, and inclusion, both inside and outside our classrooms. To this end, DLHS upholds the expectations that all courses will: (1) be inclusive, (2) promote honest & respectful discussions, (3) follow multicultural ground rules and (4) abide by UM policies and procedures. Inclusive courses are those in which teachers and learners co-create and co-sustain environments that support and encourage all members to participate equitably.

<https://rackham.umich.edu/rackham-life/diversity-equity-and-inclusion/>

Student Mental Health and Well-Being

The University of Michigan is committed to advancing the mental health and wellbeing of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, contact Counseling and Psychological Services (CAPS) at (734) 764-8312 and <https://caps.umich.edu/> during and after hours, on weekends and holidays, or through its counselors physically located in schools on both North and Central Campus. You may also consult University Health Service (UHS) at (734) 764-8320 and <https://www.uhs.umich.edu/mentalhealthsvcs>, or for alcohol or drug concerns, see www.uhs.umich.edu/aodresources.

For a listing of other mental health resources available on and off campus, visit: <http://umich.edu/~mhealth/>.

Student Parents and Caregivers

If you are a pregnant, parenting student, or primarily responsible for providing care for a loved one or family member, and you need any accommodations, please let the instructor know at your earliest convenience. You may also reach out to mcasp.org and [CEW+](https://cewplus.org) for resources and community support.

Sexual Misconduct/Sexual Harassment Reporting

Title IX prohibits sex discrimination to include sexual misconduct: harassment, domestic and dating violence, sexual assault, and stalking. If you or someone you know has been harassed or assaulted, you can receive confidential support and academic advocacy at the Sexual Assault Prevention and Awareness Center (SAPAC). SAPAC can be contacted on their 24-hour crisis line, 734-936-3333 and online at sapac.umich.edu. Alleged violations can be reported non-confidentially to the Office for Institutional Equity (OIE) at institutional.equity@umich.edu. Reports to law enforcement can be made to the University of Michigan Police Department at 734-763-3434.

Support for Food Insecurity

Students across the country experience food insecurity at alarming rates. The Maize and Blue Cupboard at the University of Michigan provides food, kitchen and cooking supplies, personal and household items, and support services. For information about accessing their services, please visit <https://mbc.studentlife.umich.edu/>

Confidentiality and Mandatory Reporting

As instructors, one of our responsibilities is to help create a safe learning environment. Dr. Gretchen Piatt also has a mandatory reporting responsibility related to her role as the Director of the Health Infrastructures and Learning Systems degree program. Instructors are required to share information regarding sexual misconduct or information about a crime that may have occurred on U-M's campus with the University. Students may speak to someone confidentially by contacting SAPAC's Crisis Line at (734) 936-3333

COVID-19 statement regarding any in-person activities

We each have a responsibility for protecting the collective health of our community. Applicable safety measures are described on the U-M Health Response website - <https://healthresponse.umich.edu/> Please bookmark this site for policies, guidance, and FAQs.

COURSE ACTIVITIES

Weekly Class Discussions: These class discussions will allow you and your peers to engage in discussion on topics being presented in the weekly resources

Weekly Mixed Media Discussion: These discussions provide opportunities to work with your team members to identify how concepts can be applied. These also provide opportunities to asynchronously see people and interact via video and to earn tokens.

Written Paper Assignments: The four written papers provide an opportunity to internalize the course concepts as well as prepare for the final paper submission.

Knowledge Checks: These short quizzes will ensure you understand the foundational concepts needed for the course.

Infrastructural Inversion Activities 1 and 2: These activities will provide you an opportunity to explore how in the real world evolutionary concepts and infrastructural layering occurs especially seeing how infrastructure disappears over time.

Final Paper: The final paper will bring together the elements of the written papers to ensure that each student has the ability to fully integrate all the course concepts and apply infrastructural thinking.

ASSIGNMENTS, DUE DATES, AND DIRECTIONS

Each week you will participate in the in two discussion boards, a mixed media discussion that requires you to include a comment on your colleagues responses using video and a weekly whole class discussion plus any assigned written assignments or exercises. Please refer to the guidelines and grading rubrics provided on Canvas.

Assignments	DUE DATE	Possible Points
Whole Class Discussions-Module 1	Aug 30 Sept 3	10
Mixed Media Discussions-Module 1	Aug 30 Sept 3	10
Knowledge Check-Module 1	Sept 3	25
Whole Class Discussions-Module 2	Sept 6 Sept 10	10
Mixed Media Discussions-Module 2	Sept 6 Sept 10	10
Knowledge Check-Module 2	Sept 10	25
Whole Class Discussions-Module 3	Sept 13 Sept 17	10
Mixed Media Discussions-Module 3	Sept 13 Sept 17	10

Whole Class Discussions-Module 4	Sept 20 Sept 24	10
Mixed Media Discussions-Module 4	Sept 20 Sept 24	10
Systems vs Infrastructure Assignment	Sept 24	100
Whole Class Discussions-Module 5	Sept 27 Oct 1	10
Mixed Media Discussions-Module 5	Sept 27 Oct 1	10
Whole Class Discussions-Module 6	Oct 4 Oct 8	10
Mixed Media Discussions-Module 6	Oct 4 Oct 8	10
Learning Health System Value Proposition Assignment	Oct 8	100
Whole Class Discussions-Module 7	Oct 11 Oct 15	10
Mixed Media Discussions-Module 7	Oct 11 Oct 15	10
Whole Class Discussions-Module 8	Oct 18 Oct 22	10
Mixed Media Discussions-Module 8	Oct 18 Oct 22	10
Gateway Assignment	Oct 22	100
Whole Class Discussions-Module 9	Oct 25 Oct 29	10

Mixed Media Discussions-Module 9	Oct 25	10
	Oct 29	
Whole Class Discussions-Module 10	Nov 1	10
	Nov 5	

Mixed Media Discussions-Module 10	Nov 1	10
	Nov 5	
Interoperability Assignment	Nov 5	100
Whole Class Discussions-Module 12	Nov 8	10
	Nov 12	
Mixed Media Discussions-Module 12	Nov 8	10
	Nov 12	
Infrastructural Inversion Exercise 1	Nov 26	100
Whole Class Discussions-Module 13	Dec 6	10
	Dec 10	
Infrastructural Inversion Exercise 2	Dec 3	50
Final Paper	Dec 10	200

ASSIGNMENTS, DUE DATES, AND DIRECTIONS

- A. **Weekly Discussions-Whole Class**-120 pts total, due in Modules 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13
- B. **Weekly Discussions-Mixed Media Class**-110 pts total, due in Modules 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12
- C. **Four written paper assignments**- 400 pts total, due in Modules 4, 6, 8 and 10
- D. **Two Knowledge Check quizzes**- 50 pts total, due in Modules 1 and 2
- E. **Infrastructural Inversion 1**-100 pts total, due in Module 12
- F. **Infrastructural Inversion 2**-50 pts total, due in Module 13
- G. **Final Paper**-200 pts total, due in Module 14

READINGS

Week	End Date	Readings
1	Sept 3	Star & Ruhleder, 1996 Edwards et al, 2007 David, 1985

2	Sept 10	Bijker et al, 2012 Pipek & Wulf, 2009 Levinson, 2006
3	Sept 17	Checkland, 1985 Ackoff, 1994 Mittleton-Kelley, Chapter 2
4	Sept 24	Bowker & Star, 1999 Graham, 2000 Egyedi & Spirco, 2011 Geiger & Ribes, 2010
5	Oct 1	Institute of Medicine, Chapter 1 DeSalvo et al, 2017 Sacristán, 2015 Star & Ruhleder, 1996
6	Oct 8	Friedman et al, 2010 Kraft et al, 2017 Friedman et al, 2015 Ackoff, 1994
7	Oct 15	Agency for Healthcare Research and Quality, n.d. Hammond et al, 2009 Raymond, Chapter 2
8	Oct 22	Plantin et al, 2016 Pletcher & Olsen, 2017 Agency for Healthcare Research and Quality, n.d. Russell & Vinsel, 2016
9	Oct 29	Pronovost et al, 2018 Braunstein (five sections), 2018
10	Nov 5	2020-2025 Federal Health IT Strategic Plan, n.d.
11	Nov 12	Bowker & Star, 1999 Medicare Learning Network, 2021 Centers for Medicare & Medicaid Services, 2021 Centers for Medicare & Medicaid Services, 2017 Centers for Medicare & Medicaid Services, March 2021

12	Nov 19	<p>Brooks et al, 2017</p> <p>Williams & Cooper, 2020</p> <p>Bowker & Star, 1999</p> <p>Centers for Medicare & Medicaid Services, 2021</p> <p>Centers for Medicare & Medicaid Services, 2017</p> <p>Centers for Medicare & Medicaid Services, March 2021</p>
13	Nov 26	<p>World Health Organization, n.d</p> <p>CMS Health Equity Technical Assistance Program, 2021</p> <p>Gottlieb et al, 2016</p>
	Dec 10	No assigned readings.