



DIGITAL HEALTH INNOVATIONS & IMPACT

CHIP400 001 Fall 2023

The University of North Carolina at Chapel Hill



COURSE INFORMATION

Credit Hours: 1.5

Pre or Co-Requisites: none

Target Audience: All students considering career pathways involving innovation in the dynamic healthcare landscape

Meeting Pattern: 50% Asynchronous / 50% Synchronous (Thurs 12:30 – 1:45pm)

Instructional Format: Lectures are asynchronous. Guest speakers and coaching sessions are synchronous.

Classroom or Location: Weekly modules on [Canvas](#). Synchronous meetings on [Zoom](#).

INSTRUCTOR INFORMATION

Name: Dale Henion, he/him/his

Email Address: daled@ad.unc.edu

Office Location: UNC Hospital, 5th Floor, Memorial Hospital

Office Hours: Thursdays 1:45 – 3:15 pm

Zoom Room ID: <https://unc.zoom.us/j/97861811153>

Teaching Philosophy: My approach aims to inspire individual reflection on topics, personal creativity, and practical application of learned content. Classroom instruction should directly inform and inspire practical application. My goal is that material and experiences enhance student knowledge, skills, and confidence in their ability to contribute to effective teams.



COURSE CONTENT

Course Description

This class equips students to develop digital health innovations using their strengths and interests within a multidisciplinary team. Lecture material and discussion boards are provided in an asynchronous format, preparing individuals for their team contributions. Synchronous class sessions are used to host guest lectures and some group activities.

Lecture material prepares students to operate in the current digital health landscape. Topics include innovation, teamwork, health economics, challenges, user centered design, niching down, health access, population health, patient engagement, standards, and interoperability.



Guest lectures are provided by industry experts to enhance student exposure and understanding of approaches to innovation and real-world application of user-centered design principles.

Supplemental Reading

Books

Pereau, K. & Lenson, B. (Eds.). (2019). *The Digital Health Revolution*. Los Angeles, CA: TranscendIT Health. ISBN-10: 0578409720
ISBN-13: 978-0578409726

Sonnier, P. (2017). *The fourth wave: Digital health - a new era of human progress*. San Diego, CA: www.StoryofDigitalHealth.com. ISBN-10: 9781976791550 ISBN-13: 978-1976791550

Neuwirth, Z. (2019). *Reframing Healthcare: A Roadmap for Creating Disruptive Change*.

Articles

Holte, A.J., Molloy, I.B., Werth, P.M., Jevsevar, D.S., (2021).

Do Patient Engagement Platforms in Total Joint Arthroplasty Improve Patient-Reported Outcomes? *The Journal of Arthroplasty*, 36(12), 3850-3858. <https://doi.org/10.1016/j.arth.2021.08.003>

Katz, L.B., Aparicio, M., Cameron, H., Ceppa, F., (2022). Use of a Meter With Color-Range Indicators and a Mobile Diabetes Management App Improved Glycemic Control and Patient Satisfaction in an Underserved Hispanic Population: "Tu Salud"—A Randomized Controlled Partial Cross-Over Clinical Study. *Diabetes Spectr*, 35(1): 86–94. <https://doi.org.libproxy.lib.unc.edu/10.2337/ds20-0101>

O'Connor, S., Hanlon, P., O'Donnell, C.A., Garcia, S., Glanville, J., Mair, F.S., (2016). Understanding factors affecting patient and public engagement and recruitment to digital health interventions: a systematic review of qualitative studies. *BMC Medical Informatics and Decision Making*, 16(120): <http://doi.org/10.1186/s12911-016-0359-3>

Santo, K., Richtering, S.S., Chalmers, J., Thiagalasingam, A., Chow, C.K., (2016). Mobile Phone Apps to Improve Medication Adherence: A Systematic Stepwise Process to Identify High-Quality Apps. *JMIR Mhealth Uhealth*, 4(4): doi:10.2196/mhealth.6742

Class Expectations

Students are expected to look at the upcoming schedule on a weekly basis and make plans to attend all synchronous class sessions. Asynchronous class work and team-based activity is expected to be scheduled and performed independently outside of class as needed.

Course Goals & Student Learning Outcomes (SLOs)

Upon completion of the course, the student will be able to:

- Describe digital health and elements of the interdependent healthcare system
- Implement a user-centered design approach to solve meaningful problems
- Work effectively and efficiently within a multidisciplinary team
- Identify and define privacy and interoperability standards
- Understand population health approaches and provide examples
- Develop prototype presentation and sales pitch skills





COURSE ASSIGNMENTS & ASSESSMENTS

Assignment Descriptions

Assignment #1 (Individual): Skills & Background

From the skills and background document provided in the link, please add a column with your name and check all skills and experience rows that pertain to you. You may also choose to enter free text in the specified rows. No additional submission needed if information is added to the shared document provided.

Assignment #2 (Individual): Goals & Interests

After reviewing the course introduction, what topics or aspects of this course are of particular interest to you? Please submit your response in the free-text space provided.

Assignment #3 (Individual): Research Problem & Solution Areas

Identify at least one topic to research. Research it to uncover the potential opportunity. Use the questions on the worksheet provided. Document a numeric score using a 5-point scale based on the answers you provide. Upload and submit your completed worksheet.

I suggest using this assignment in the coming week to share with your group as your contribution to brainstorm potential topics for your group to pursue this term.

Assignment #4 (Group): Project Topic Selection

Gather in your groups and brainstorm topics based on your individual research and scoring. Adjust scores and develop consensus around pros/cons for each project idea. Choose one person to submit your group's final topic selection and explain why it was chosen. If you can't decide between two topic finalists, you may keep them both until further research and vetting leads you to a final decision in the coming weeks.

Assignment #5 (Group): Gant Chart

Use upcoming deliverables and project elements to develop a Gant chart. This chart will be a point of reference for all activities and timelines moving forward, supporting accountability and effective collaboration. A template has been provided, but your group is welcome to use another platform or template as long as it includes the needed activities, due dates, and owners for each activity.

Assignment #6 (Group): Team Charter

Create a charter based on shared expectations for your team. Include the below elements:

- Team/Company name
- Members & roles & responsibilities
 - Example:
 - Team Lead: Tonya Wilson
 - Submits group deliverables.
 - Sends meeting invites.
 - Combines and edits written work.
 - Ensures graphic designer role in group has what they need for final graphic formatting.
- Goal(s)
- General Expectations (examples: respect, giving everyone a voice, work-culture, etc.)
- Communication plan (including methods, frequency, and reply interval if asynchronous)
- Meeting plan (include platform and schedule or general plan)

Assignment #7 (Individual): Gap Analysis

What underlying issues can be addressed at a population level to promote improved health for one or more of the populations discussed in today's lecture? Propose at least one solution that could be explored.



Assignment #8 (Individual): Customer Story Leads

Do you have a customer story for your project? If so, please summarize. If you don't yet have a customer story behind your project already, how might you obtain one? Your answer may include other members of your group based on your discussions so far and their potential contacts. Be sure to follow up on this as needed over the next week. You'll be expected to submit your customer story in module 8. This should be based on actual reported experiences rather than hypothetical.

Assignment #8 (Individual): Speaker Review Population Health

What did you learn or find interesting? Additional feedback is welcomed.

Assignment #9 (Individual): Speaker Review iPICS Project

What did you learn or find interesting? Additional feedback is welcomed.

Assignment #10 (Individual): Niching Exercise

Answer the below questions for your current intended target population of your product:

- What are the major variables that could be used to meaningfully group your target audience and how they interact with your problem/solution? Examples might include age groupings, literacy or educational groupings, rural/urban settings, language, insurance, income, specific activities, co-morbidities, health status, etc.
- Within the variables above, which combination of factors define the population that is in the most need of a solution?
- Within the variables above, which combination of factors define the population that is most likely to succeed because of the solution?
- Is there a combination of factors that can be created to define the population that needs a solution the most AND is most likely to succeed?

Assignment #11 (Group): Customer Story

Tell your customer story to demonstrate the problem your company is solving.

Assignment #12 (Individual): User Engagement

What strategies might be used to engage end-users of your product? Which strategies are likely to have the highest value-add for your users and why?

Assignment #13 (Individual): Potential Partners

What people or groups have access to your ideal customer? Explain how their interests and your interests are in alignment? Of these, which partnership might be most crucial to the beta-launch and testing phases of your project?

Assignment #14 (Group): Project Niche

Discuss the results of the niching exercise you completed individually within your group. Develop a group consensus around the target characteristics of your ideal customer audience. Submit your group's description and include any needed explanations.

Assignment #15 (Individual): Regulatory Standards

What standards would your group's digital innovation need to abide by?

Assignment #16 (Individual): Testing Design

How might you design the testing phase of your product. Include a description of the primary stakeholders involved, the primary endpoints measured for success, duration of testing, and other information that might be used for feedback and iteration.

Assignment #17 (Group): User Needs

Describe or list the user needs for your primary and secondary target audiences.



Assignment #18 (Individual): Speaker Review Commercialization Pathways

What did you learn or find interesting? Additional feedback is welcomed.

Assignment #19 (Group): Written Proposal

This written proposal should thoroughly describe your project. It may include graphics that will be used in the final presentation to the class, but if you don't have the graphics ready at this point then text alone is adequate. The following elements should be included:

Executive Summary/Elevator Pitch

- Your team members
- Your product opportunity, customer, and vision

Customer Experience and Trends

- Customer story
- Customer's feelings/level of importance on the issue
- Size & weight of the problem (# people and/or dollars and other impact if applicable)
- Industry trends
- Competitors in the space

Your Game Winning Product

- How it meets your customer need
- What makes it unique
- Key features and functionality
- How information is displayed/communicated

Development Timeline & Startup Costs

- Proposed timeline with key milestones
- Industry partners (if applicable)
- Testing design and collaborators
- Start-up cost estimates

References

Assignment #20 (Individual): Speaker Review Advanced Care at Home

What did you learn or find interesting? Additional feedback is welcomed.

Assignment #21 (Group): Project Pitch Presentation

The day has come! All the team's hard work has paid off and your new product has attracted the attention of a few potential investors! You create a video presentation to submit to these investors to pitch your idea and convince them that your team's product is worth investing in. Your video submission can be uploaded to the discussion forum created for each group.

Students typically use products such as Adobe XD (available in the adobe suite through the university) or Figma to create visual representations of their product elements for their presentation. If you use slides, a Prezi, or story board, use no more than 10 slides. Keep it simple. Less is often more!

Ensure that your presentation includes the key elements in the written proposal but does not drown the audience with unnecessary details.

Presentation is an important skill for everyone to develop, so please include a role for everyone on your team in the presentation. Your presentation should be in the range of 7-15 minutes. Most importantly, sell your product! Your energy and enthusiasm should be contagious! Finally, be prepared to answer follow-up questions in the forum.



Disclaimer: No funds will be distributed as a part of this project. Student will gain skills and experience conceptualizing, prototyping, and selling their product!

Assignment #22 (Individual): Speaker Review Data Architecture for Business Model Development

What did you learn or find interesting? Additional feedback is welcomed.

Assignment #23 (Individual): Class Presentation Forums:

Watch each group presentation and provide at least one thoughtful comment to each group. Please be more specific than simply stating "great job".

Grading Scale & Schema

Late Work

Late work will be accepted on a case-by case scenario, but anything over 24 hours late may be subject to a 50% point deduction per assignment.

Grading Rubrics

Grades will be primarily based on completion of the elements specifically requested by assignment. If submissions for two-point or five-point assignments are lacking any of the elements specifically requested, one or more points may be deducted. For the written proposal and final presentation, one point may be deducted for each missing element of the assignment description. Consideration will also be given to the content itself and formatting/presentation.

Individual Assignments = 30%

- 2 points per assignment

Group Assignments = 60%

- Written Proposal = 15 points
- Video Presentation = 15 points
- All others = 5 points each

Team Evaluation Form = 10%

- This includes both self-evaluation and peer evaluation elements.
- Every individual submits one for their team.

Graduate Grading Scale

What it means	Letter Grade
High Pass	H
Pass	P
Low Pass	L
Fail	F
Incomplete	IN
Satisfactory Progress on Research	S
Absent From Final Exam	AB
No Grade Assigned	NG



Undergraduate Grading Scale

Numeric Grade (%)	Letter Grade
93.5 and above	A
89.5 – 93.4	A-
86.5 – 89.4	B+
82.5 – 86.4	B
79.5 – 82.4	B-
76.5 – 79.4	C+
72.5 – 76.4	C
69.5 – 72.4	C-
66.5 – 69.4	D+
59.5 – 66.4	D
59.4 and below	F

Table a: Grading Scale Table

COURSE SCHEDULE

Module #1 – Asynchronous

8/21 – 8/27

Topics	Individual Assignments	Group Assignments
Professor Introduction	Skills & Background	N/A
Course Overview	Goals & Interests	
Course Structure/Schedule		
Student Expectations		
Teacher Expectations		
Assignment Instructions		

Table b: Unit/Module 1 Schedule

Module #2 – Asynchronous

8/28 – 9/03

Topics	Individual Assignments	Group Assignments
Interconnected Health System	Research Problem & Solution Areas	
Health System Challenges		
Assignment Instructions		

Table c: Unit/Module 2 Schedule

Module #3 – Synchronous

Thursday 9/07 12:30 – 1:45pm



Topics	Individual Assignments	Group Assignments
Group Forming	N/A	Project Topic Selection
Brainstorming Sessions		

Table c: Unit/Module 2 Schedule

Module #4 – Asynchronous 9/11 – 9/17

Topics	Individual Assignments	Group Assignments
Innovation	N/A	Team Gant Chart
Teamwork		

Table c: Unit/Module 2 Schedule

Module #5 – Asynchronous 9/18 – 9/24

Topics	Individual Assignments	Group Assignments
User Centered Design	N/A	Team Charter

Table c: Unit/Module 2 Schedule

Module #6 – Asynchronous 9/25 – 10/01

Topics	Individual Assignments	Group Assignments
Population Health	Gap Analysis	N/A
Customer Story	Customer Story Leads	

Table c: Unit/Module 2 Schedule

Module #7 – Synchronous

Thursday 10/05 12:30 – 1:45pm

Topics	Individual Assignments	Group Assignments
Guest Speaker: Population Health	Speaker Review	N/A

Table c: Unit/Module 2 Schedule

Module #8 – Synchronous

Thursday 10/12 12:30 – 1:45pm

Topics	Individual Assignments	Group Assignments
Guest Speaker: iPICS Project	Speaker Review	Customer Story
	Niching Exercise	



Table c: Unit/Module 2 Schedule

Module #9 – Asynchronous 10/16 – 10/22

Topics	Individual Assignments	Group Assignments
Patient Engagement	User Engagement	N/A
Needs Assessment		
Testing & Feedback		

Table c: Unit/Module 2 Schedule

Module #10 – Synchronous

Thursday 10/26 12:30 – 1:45pm

Topics	Individual Assignments	Group Assignments
Group Coaching Sessions	Potential Partners	Project Niche
Customer Niche		
User Needs		
Solution Design		

Table c: Unit/Module 2 Schedule

Module #11 – Asynchronous

10/30 – 11/05

Topics	Individual Assignments	Group Assignments
Interoperability	Regulatory Standards	User Needs
Regulatory Standards	Testing Design	

Table c: Unit/Module 2 Schedule

Module #12 – Synchronous

Thursday 11/09 12:30 – 1:45pm

Topics	Individual Assignments	Group Assignments
Guest Speaker: Pathways to Commercialization	Speaker Review	Written Proposal

Table c: Unit/Module 2 Schedule

Module #13 – Synchronous

Thursday 11/16 12:30 – 1:45pm



Topics	Individual Assignments	Group Assignments
Guest Speaker: Advanced Care at Home	Speaker Review	Submit Project Presentation Video

Table c: Unit/Module 2 Schedule

Module #14 – No Class

Thursday 11/20 – 11/26

Topics	Individual Assignments	Group Assignments
Thanksgiving Break	Enjoy your break!	N/A

Table c: Unit/Module 2 Schedule

Module #15 – Synchronous

Thursday 11/30 12:30 – 1:45pm

Topics	Individual Assignments	Group Assignments
Guest Speaker: Strategic Data Architecture for Business Model Development in Health IT Initiatives	Speaker Review	N/A
	Class Presentation Discussion Forums	

Table c: Unit/Module 2 Schedule



POLICY STATEMENTS

Academic Policies

University Class Attendance Policy

University Policy: As stated in the University's [Class Attendance Policy](#), no right or privilege exists that permits a student to be absent from any class meetings, except for these University Approved Absences:

1. Authorized University activities: [University Approved Absence Office \(UAAO\) website](#) provides information and [FAQs for students](#) and [FAQs for faculty](#) related to University Approved Absences
2. Disability/religious observance/pregnancy, as required by law and approved by [Accessibility Resources and Service](#) and/or the [Equal Opportunity and Compliance Office](#) (EOC)
3. Significant health condition and/or personal/family emergency as approved by the [Office of the Dean of Students](#), [Gender Violence Service Coordinators](#), and/or the [Equal Opportunity and Compliance Office](#) (EOC).

Instructors may work with students to meet attendance needs that do not fall within University approved absences. For situations when an absence is not University approved (e.g., a job interview, illness/ flu or club activity), instructors are encouraged to work directly with students to determine the best approach to missed classes and make-up assessment and assignments.



Honor Code Statement

All students are expected to follow the guidelines of the UNC Honor Code. In particular, students are expected to refrain from “lying, cheating, or stealing” in the academic context. If you are unsure about which actions violate the Honor Code, please see me, or consult studentconduct.unc.edu.

Syllabus Changes

The instructor reserves the right to make changes to the syllabus including project due dates and test dates. These changes will be announced as early as possible.

Acceptable Use Policy

By attending the University of North Carolina at Chapel Hill, you agree to abide by the University of North Carolina at Chapel Hill policies related to the acceptable use of IT systems and services. The Acceptable Use Policy (AUP) sets the expectation that you will use the University’s technology resources responsibly, consistent with the University’s mission. In the context of a class, it’s quite likely you will participate in online activities that could include personal information about you or your peers, and the AUP addresses your obligations to protect the privacy of class participants. In addition, the AUP addresses matters of others’ intellectual property, including copyright. These are only a couple of typical examples, so you should consult the full [Information Technology Acceptable Use Policy](#), which covers topics related to using digital resources, such as privacy, confidentiality, and intellectual property. Additionally, consult the [Safe Computing at UNC](#) website for information about data security policies, updates, and tips on keeping your identity, information, and devices safe.

Data Security & Privacy

[UNC-Chapel Hill Privacy Statement](#): Canvas Discussion Forum, Assignments, DropBox, Gradebook, and Tests & Quizzes tools are designed to share FERPA-protected information privately between instructors and individual students.

Grade Appeal Process

If you have any concerns with grading and/or feel you have been awarded an incorrect grade, please discuss it with me as soon as possible. If we cannot resolve the issue, you may talk to our director of undergraduate studies or department chair.

Services & Student Support Policies

Accessibility Resources & Services (ARS)

[Accessibility Resources and Service](#) (ARS – ars@unc.edu) receives requests for accommodations, and through the Student and Applicant Accommodations Policy determines eligibility and identifies reasonable accommodations for students with disabilities and/or chronic medical conditions to mitigate or remove the barriers experienced in accessing University courses, programs and activities. ARS also offers its Testing Center resources to students and instructors to facilitate the implementation of testing accommodations. Faculty and instructors with any concerns or questions about accommodations and/or their implementation, are invited to [reach out to ARS](#) to discuss.

Counseling & Psychological Services (CAPS)

UNC-Chapel Hill is strongly committed to addressing the mental health needs of a diverse student body. The [Heels Care Network](#) website is a place to access the many mental health resources at Carolina. CAPS is the primary mental health provider for students, offering timely access to consultation and connection to clinically appropriate services. Go to their website <https://caps.unc.edu/> or visit their facilities on the third floor of the Campus Health building for an initial evaluation to learn more. Students can also call CAPS 24/7 at 919-966-3658 for immediate assistance.

Title IX Resources

Any student who is impacted by discrimination, harassment, interpersonal (relationship) violence, sexual violence, sexual exploitation, or stalking is encouraged to seek resources on campus or in the community. Reports can be made online to the EOC at <https://eoc.unc.edu/report-an-incident/> or by contacting the University’s Title IX Coordinator (Elizabeth Hall, titleixcoordinator@unc.edu) or the Report and Response Coordinators in the Equal Opportunity and Compliance Office (reportandresponse@unc.edu). Confidential resources include Counseling and Psychological



Services and the Gender Violence Services Coordinators (gvsc@unc.edu). Additional resources are available at safe.unc.edu.

Policy on Non-Discrimination

The University is committed to providing an inclusive and welcoming environment for all members of our community and to ensuring that educational and employment decisions are based on individuals' abilities and qualifications. Consistent with this principle and applicable laws, the University's [Policy Statement on Non-Discrimination](#) offers access to its educational programs and activities as well as employment terms and conditions without respect to race, color, gender, national origin, age, religion, genetic information, disability, veteran's status, sexual orientation, gender identity or gender expression. Such a policy ensures that only relevant factors are considered, and that equitable and consistent standards of conduct and performance are applied. If you are experiencing harassment or discrimination, you can seek assistance and file a report through the Report and Response Coordinators (email reportandresponse@unc.edu or see additional contact info at safe.unc.edu) or the Equal Opportunity and Compliance Office at <https://eoc.unc.edu/report-an-incident/>.

Diversity Statement

I value the perspectives of individuals from all backgrounds reflecting the diversity of our students. I broadly define diversity to include race, gender identity, national origin, ethnicity, religion, social class, age, sexual orientation, political background, and physical and learning ability. I strive to make this classroom an inclusive space for all students. Please let me know if there is anything I can do to improve. I appreciate any suggestions.

Undergraduate Testing Center

The College of Arts and Sciences provides a secure, proctored environment in which exams can be taken. The center works with instructors to proctor exams for their undergraduate students who are not registered with ARS and who do not need testing accommodations as provided by ARS. In other words, the Center provides a proctored testing environment for students who are unable to take an exam at the normally scheduled time (with pre-arrangement by your instructor). For more information, visit <http://testingcenter.web.unc.edu/>.

Learning Center

Want to get the most out of this course or others this semester? Visit UNC's Learning Center at <http://learningcenter.unc.edu> to make an appointment or register for an event. Their free, popular programs will help you optimize your academic performance. Try academic coaching, peer tutoring, STEM support, ADHD/LD services, workshops and study camps, or review tips and tools available on the website.

Writing Center

For free feedback on any course writing projects, check out UNC's Writing Center. Writing Center coaches can assist with any writing project, including multimedia projects and application essays, at any stage of the writing process. You don't even need a draft to come visit. To schedule a 45-minute appointment, review quick tips, or request written feedback online, visit <http://writingcenter.unc.edu>.