inclusive HCI/d Graduate Programs 2022/23
Curriculum Tables & Handbook

Subject to Revisions V3.20.2022

Students entering in 2021/22 may take the same classes as students who entered in 2020/2021 if they choose. Students entering in 2022/23 may take the same classes as students who entered in 2021/2022 if they choose. These curriculum tables offer more choices than were offered before and involve a more inclusive notion of our faculty community.

For 2021/22 we introduced a few key goals that carry over into 2022/23:

> *Include more faculty who are affiliated with HCI and/or Design, that is iHCI/d.*

> *Make the program robust and not brittle with respect to Fall and Spring intakes going forward and as a response to current conditions, make it possible for a student who starts in Spring semester to graduate in the following Spring semester by taking Winter and Summer session courses modulo minimal enrollment thresholds.*

> *Adopt an inclusive notion of faculty and themes in inclusive HCI/d, while preserving the core of design-oriented HCI as a continuation of the program in its traditions.*

> *Offer a clearer rationale for elective choices so that students can elect to specialize in (a) experience design, (b) design strategy and product management, (c) interaction design, (d) HCI/d scholarship, (e) an inclusive cross-cutting area, or (f) a combination.*

**LUDDY SCHOOL OF
INFORMATICS, COMPUTING,
AND ENGINEERING**

INDIANA UNIVERSITY

Contents

Administration

Justin Wood, Associate Professor (Intelligent Interactive Systems IIS), Director HCI/d MS

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Faculty (boxes denote HCI/d core faculty)

Yong-Yeol Ahn, Associate Professor of Informatics (Visualization)

Eli Blevis, Professor (HCI/d), Director HCI/d PhD
Shunying An Blevis, Visiting Lecturer (HCI/d)
Travis Brown, Senior Executive Assistant Dean (HCI/d, Strategy)

Jean Camp, Professor of Informatics (Security and Privacy)

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Christina Chung, Assistant Professor (Health)

James Clawson, Assistant Professor (Health)

Kay Connelly, Professor (Health)

Hamid Ekbia, Professor (HCI/d, Political Economy)
Dana Habeeb, Assistant Professor (Health, HCI/d)
Maryam Heidaripour, Visiting Professor (HCI/d)

Akesha Horton, Director of Curriculum and Instruction

Apu Kapadia, Professor (Security)

Samantha Merritt, Adjunct Instructor

Christena Nippert-Eng, Professor (Computing, Culture, and Society CCS, Animal-Computer Interaction ACI)

Sameer Patil, Associate Professor (Security)

Kayce Reed-Buechlein, Adjunct Professor (HCI/d, Product Management)

Selma Šabanović, Associate Professor (Intelligent Interactive Systems IIS, Computing, Culture, and Society CCS, Human-Robot Interaction HRI)

Patrick Shih, Assistant Professor (Health, Animal-Computer Interaction ACI)

Katie Siek, Professor (Health)

Erik Stolterman, Professor (HCI/d, Design Theory, Experience Design)

Jennifer Terrell, Senior Lecturer (Computing, Culture, and Society CCS)

Kate Wehner, Adjunct Instructor (Information & Library Sciences ILS)

David Wild, Professor of Computing and Informatics (Crisis Informatics)

Brian Wood, Lecturer (VR)

Justin Wood, Associate Professor (Intelligent Interactive Systems IIS), Director HCI/d MS

Welcome

Academic Year (AY) 2022/23 marks the twentieth anniversary of our HCI/d program. Our program is arguably the first in the USA to combine HCI with an orientation in Design. Beginning in AY 2020/21, we have introduced the notion of *inclusivity* to our program to create *inclusive human-computer interaction design* (iHCI/d). By *inclusivity*, we mean that we now include many faculty whose research and teaching touches HCI and Design along many varied dimensions and brings broadened transdisciplinary perspectives. We also mean that we have—in augmenting our notion of affiliated faculty—broadened the diversity of our faculty in keeping with our student demographics. Our student community has always been uniquely diverse as a feature of our program. All are welcome!

For questions you have about our program, kindly refer to the directory that follows.

For matters regarding the MS Program:

- Dr. Justin Wood, Director of the HCI/d MS program
  woodjn@indiana.edu

For matters regarding the PhD Program:

- Dr. Eli Blevis, Director of the HCI/d PhD program
  eblevis@indiana.edu

For inquiries about how to apply to our program:

- Luddy Graduate Admissions
  GoLuddy@iu.edu

For current student advice about course requirements and registration:

- Luddy Graduate Advising
  gradvise@indiana.edu

For information about Careers and placement data, please see:

- Luddy Career Services
  luddycareers@indiana.edu
- *https://luddy.indiana.edu/career-services/index.html*

For all other matters:

- Luddy Graduate Services
  goluddy@iu.edu

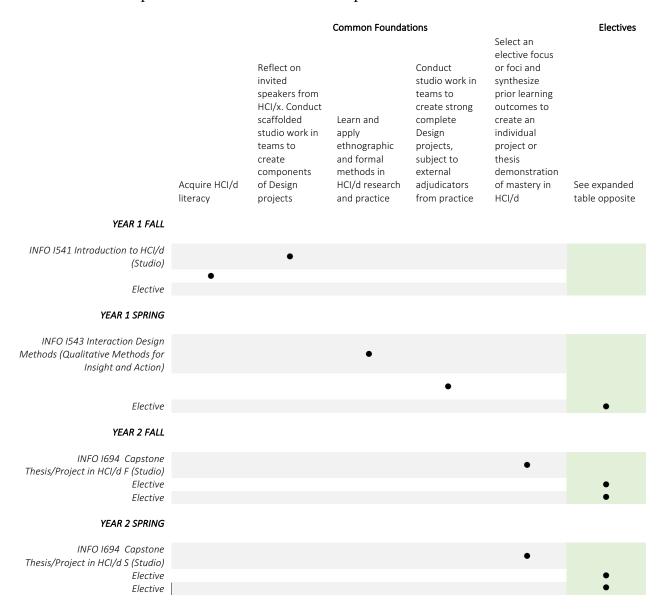**Please also refer to our websites:**

- Luddy HCI/d MS
  https://informatics.indiana.edu/programs/ms-hci.html
- HCI/d MS special site
  https://hcid.luddy.indiana.edu/
- Luddy HCI/d PhD
  https://informatics.indiana.edu/programs/phd-informatics/human-computer-interaction-design.html

Required Classes Curriculum Map

	Acquire HCI/d literacy	Common Foundations				Electives
		Reflect on invited speakers from HCI/x. Conduct scaffolded studio work in teams to create components of Design projects	Learn and apply ethnographic and formal methods in HCI/d research and practice	Conduct studio work in teams to create strong complete Design projects, subject to external adjudicators from practice	Select an elective focus or foci and synthesize prior learning outcomes to create an individual project or thesis demonstration of mastery in HCI/d	See expanded table opposite
YEAR 1 FALL						
INFO I541 Introduction to HCI/d (Studio)		●				
	●					
Elective						
YEAR 1 SPRING						
INFO I543 Interaction Design Methods (Qualitative Methods for Insight and Action)			●			
				●		
Elective						●
YEAR 2 FALL						
INFO I694 Capstone Thesis/Project in HCI/d F (Studio)					●	
Elective						●
Elective						●
YEAR 2 SPRING						
INFO I694 Capstone Thesis/Project in HCI/d S (Studio)					●	
Elective						●
Elective						●

Electives Curriculum Map

Course Number/Name	Experience Design, Design Strategy, and Product Management	Interaction Design	Scholarship	Cross-cutting
I507 Introduction to Health Informatics			●	●
I511 ACI Methods: Games for Animals	●	●		
I512 Direct Observation and Design	●	●	●	
I514 ACI Seminar on Tech for Animals		●	●	
I516 Informatics in Disasters and Emergency Response	●	●		
I525 Economics of Information Security				●
I527 Patrick Shih: Mobile and Pervasive Design		●	●	●
I530 Field Deployments		●		●
I537 Legal and Social Informatics of Security		●	●	●
I540 Human-Robot Interaction		●	●	
I544 Experience Design	●	●		
I549 Advanced Prototyping	●	●		
I566 TBD: Technology Innovation	●			
I567 Design Strategy	●			
I568 Technology Entrepreneurship	●			
I590 Cross-Platform Mobile Programming		●		
I590 Data Visualization	●		●	
I590 Data Visualization with Tableau	●	●	●	
I590 Creating Virtual Assets	●	●		
I590 Building Virtual Worlds	●	●		
I590 Artificial Life in VR	●	●		
	●			
I590 Advanced Information Ethics			●	●
	●			●
I590 Product Management	●			
			●	●
I590 Prototyping with Arduino Tools			●	
I590 Android Programming		●		
	●	●	●	
I590 Journal Article Writing			●	●
			●	●
I590 Smart Cities	●		●	●
		●		●
I590 Graduate seminar on Usable Privacy and Security		●	●	●
			●	
I609/I709 Advanced Seminar in HCI/d			●	●
			●	●
Z604 Information Architecture in Practice		●		●
LAIDEL Practicum Course	●	●		

Students wishing to specialize in experience design, design strategy and product management, interaction design, HCI/d scholarship, or an inclusive cross-cutting area are encouraged to select several electives from a single column. Students seeking more breadth may prefer to select electives from two or more of the columns.

In general, any class numbered 500 and above university wide may be an elective with approval of the director.

Classes listed above are pre-approved.

ELECTIVE CLASSES ARE SUBJECT TO CHANGE. KINDLY CONSULT THE *OFFICIAL COURSE SCHEDULES*.

Common Foundations (Description of Required Classes)

I541: Introduction to HCI/d
This course features studio work in teams to create Design project components with scaffolded instruction about the different forms of constituent elements of complete Design projects. The course also features an invited speaker series. Participants practice individual creative and reflective response to a selection of invited speakers on themes in HCI/d and/or themes synergistic with HCI/d research and practice. When possible, the Design project teamwork is adjudicated by external professional designers in addition to the instructors. The class broadly covers experience design, design strategy, project management, interaction design, scholarship, and cross-cutting areas.

I542: Foundations of HCI
This course offers a survey overview of the field of Human-Computer Interaction. It introduces the main themes of HCI set generally in a historical context. The field of HCI is both young and dynamic. Unlike more mature disciplines, such as Biology or English, HCI is still finding its intellectual identity and agenda. An interdisciplinary field, HCI reflects concerns, and draws on resources, from cognitive science, sociology, engineering, philosophy, design, and digital media studies. Even today, HCI is undergoing major intellectual shifts from an older paradigm of HCI that integrated the above disciplines to a newer paradigm that integrates design, humanistic, socio-economic, and environmental approaches.

I543: Methods
This class will cover the use of qualitative methods in HCI and UX research from data collection and analysis to "action" (for exploratory, communicative, evaluative, and generative goals). Methods covered will encompass ethnography (interviews and participant observations), grounded theory, thematic analysis, cultural probes, diary studies, and surveys. We will highlight current debates about qualitative research and how quantitative methods and qualitative methods can be complementary. This class will also feature guest speakers from industry who can speak to opportunities and challenges of doing UX research in organizations. Students will gain hands-on experience doing, analyzing, and communicating fieldwork (including virtual methods given the pandemic). The class will introduce common tools used by qualitative researchers.

I544: Experience Design (*Required for 2019/20 Class, Elective in 2020/21*)
Every interactive device, artifact and system is designed. Every interactive artifact that is used by someone leads to a user experience. This course is about these user experiences. Students will be introduced to a diverse set of thinking about human experience in general and user experience of interactive systems in particular. In a highly participatory environment, students will analyze and design interactive artifacts and engage in theoretical and conceptual readings and discussions around questions such as:

- What is an experience and what is a user experience?
- What makes an experience fun, cool, exciting, boring, complicated, simple, etc.?
- Is it possible to design experiences, or can we only design interactive products?
- How best can designers observe and learn by analyzing and studying user experiences?
- How do qualities of interactive products, such as functionality, usability, and aesthetics, relate to or even cause experiences? And how can they be measured?"

I561: Meaning and Form

This course features studio work in teams to create strong design portfolio demonstration projects. When possible, the Design project teamwork is adjudicated by external professional designers in addition to the instructors. The class broadly covers experience design, design strategy, project management, interaction design, scholarship, and cross-cutting areas.

I694: Capstone/Thesis Project in HCI/d I and II

The Capstone course represents the conclusion of the HCI/d professional Master's program. In it, students pursue their own independent project, scaffolded by the course, including their peers. The Capstone project is each student's opportunity to show—themselves, their peers, and potential employers—what they are capable of, both in conception and in execution. The Capstone is the final valuation of each student as a designer with a professional Master's Degree. It is the moment where students demonstrate what they are individually capable of, in a larger project, without the scaffolding of a traditional class and also without teammates. The projects are self-guided and self-led. Ultimately, each student is responsible for their success. However, the instructor team is available for critical feedback, to provide resources, and to help students move their work forward.

Electives (Description of Pre-Approved Elective Courses)

*This is a non-exhaustive list of some pre-approved elective courses for the HCI/d MS Program. Please see the Elective Curriculum Map (pg. 6) for a complete list of pre-approved courses. The list below is intended to show the variety of options available for elective courses.

***Please consult the **OFFICIAL COURSE SCHEDULES** for a list of courses offered this semester.*

I507: Introduction to Health Informatics
This is a combined advanced undergraduate and graduate course that provides an introduction to health informatics. By the end of the course, students will be able to describe and apply informatics methods that improve health and well being.

I511: ACI Methods – Games for Animals
Animals can use computers too. The field of Animal Computer Interaction (ACI) explores conceptual and practical aspects of how animals interact with modern technology. Primates in captivity, for example, often participate in computer touch-panel tasks for research and enrichment purposes. In developing such kinds of computer tasks, it is necessary to create a User Experience (UX) that targets the physical and mental capabilities of a given species, and to build hardware and software that is informed by relevant research findings from the fields of animal behavior and cognition. This course introduces cutting-edge ACI methods and takes a critical approach to the issues of access, ethics, implementation, scale, and evaluation of those methods. The curriculum is designed to assist students in developing strategies and technological skills to work amid the rapidly evolving landscape of animal care, research, conservation, and management, while also highlighting the many assumptions underlying interaction design for humans.

I514: ACI Seminar – Seminar on Tech for Animals
This is primarily a readings and discussion seminar that serves as an introduction to the field of Animal-Computer Interaction. Together, we draw on faculty and student-selected readings, multimedia materials, and guest lectures from current ACI designers/researchers/practitioners to explore the ethics, history, state-of-the-art, and possible futures for this broad field of practice. We focus on five emerging areas in ACI research and applications: maker applications for animals; automated quality of life data capture and analysis for captive animal health and wellness; wildlife tracking and monitoring; animal cognition; and interspecies relationships and education.

I516: Informatics in Disasters and Emergency Response
Technology plays a critical role in prevention of, mitigation of, response to and recovery from threats to safety, and emergency and disaster situations. Informatics in Disasters and Emergency Response (IDER) engages students in thought-provoking and practical ways with the technology that can help – and sometimes hinder – from the perspective of three constituents: the students themselves, emergency managers, and emergency responders. Specific topics include designing for situational awareness and high stress situations; technology in big disasters; threat modeling, tabletop exercises, internet and social media resources, and data science / Internet of Things (IoT). There will also be talks from and podcast-like discussions with guest practitioners. Grading is through topic-based homework assignments and a real-world project.

I525: Economics of Information Security
Deciding to click a link or apply an update is a case of decision-making under uncertainty. At its core, this course should inform both your own decision-making in the face of security and privacy risks and you understanding of the decisions made by others. Our insights result from examining these decisions from a lens of incentives (classical economics) and perception (behavioral economics). Systems are examined both as formal incentives models as well as human-centered or

decision-support technologies using a range of techniques from statistical models to qualitative investigations.

I527: Mobile and Pervasive Design

Mobile and pervasive computing "moves beyond the desktop" to having computing devices embedded in the world around us. Handheld devices, mobile and wireless technologies, sensor technologies and 'smart places' are just a few of the advances enabling truly pervasive computing. The aim of this course is to provide students with the ability to design and implement novel user interactions with mobile and pervasive technologies. We will discuss new interaction paradigms and gain experience with different technologies. Students will learn how to design, build, implement and refine mobile and pervasive computing applications for their domain of interest, including – but not limited to - health, security, robotics, social informatics, and business.

I540: Human-Robot Interaction

This course surveys the field of human-robot interaction (HRI), which involves understanding how people perceive and respond to robots to inform the design of robots that can interact with people in various everyday contexts. We will discuss the design, evaluation, and societal applications and consequences of interactive robots from a human-centered perspective through readings, assignments, and in-class discussion. Students will also develop their own HRI prototypes throughout the semester.

I549: Advanced prototyping

This course will be taught asynchronously in the Fall of 2021 and very closely aligns with I590 Mobile Human Computer Interaction & Design. Broadly stated, there are three goals for this class: (1.) Understand the principles of user-centered design and how to apply them to mobile contexts; (2.) Understand the history of mobile and wearable human-computer interaction and lean how it has changed over time; (3.) Explore why "good" interface design is not necessarily "common sense" particularly when it comes to on-the-go use of a system. We will achieve these goals by completing a variety of short activities (design exercises, online discussions, etc.), a group project, weekly quizzes that cover the course materials and reading an article each week with an accompanying writeup. The weekly course materials help students acquire skills to design, prototype, and evaluate user-centered mobile and wearable systems.

I566: Technology Innovation

This course will teach students the process of innovation, specifically in respect to technological innovation. Students will be required to ideate technological concepts given a set of constraints and an opportunity space. The focus of the course will be for students to invent and implement without considering the commercial potential of their innovations. Concepts covered will include abductive reasoning, problem framing, pattern recognition, and trend analysis. Students will be required to rapidly prototype their concepts in order to present their innovations in class. The class will culminate in an innovation competition, which will entail students completing an innovation challenge and presenting their solutions to a panel of judges who will evaluate their technologies based on the depth of innovative thinking demonstrated.

I590: Cross-Platform Mobile Programming

Cross-platform mobile development allows developers to create one code-base for multiple platforms. It also creates an opportunity for designers to quickly create and iterate on high-fidelity prototypes. Unlike mobile web apps, these cross-platform apps run in a native shell within each platform and thus do not require internet connectivity. They support a consistent look-and-feel across platforms with less effort, easier maintenance, and a better reach to a broader set of users. In this course, we will focus on one cross-platform framework, React Native, which builds on JavaScript and React JS to wrap native codes and APIs. Mobile development on React Native,

therefore, can be achieved using modern web technologies. This course is designed for students with some prior JavaScript programming experiences. Throughout the course, we will continue developing skills around these web technologies to leverage on-device utilities and sensors as well as process data from both external and internal resources.

I590: Product Management

This course will expose students to the discipline of product management, a multidisciplinary profession which demands a holistic perspective in order to shepherd a product from inception to implementation to ensure that it is successful in the market. Students will be required to work on multidisciplinary teams and complete product proposals based on their analysis of an existing or a new product, which will be in the form of both case-based and client-based projects. Each project will require students to analyze the feasibility and long-term viability of a product from a business, design, and engineering perspective.

I590: Cross-Platform Mobile Programming

Cross-platform mobile development allows developers to create one code-base for multiple platforms. It also creates an opportunity for designers to quickly create and iterate on high-fidelity prototypes. Unlike mobile web apps, these cross-platform apps run in a native shell within each platform and thus do not require internet connectivity. They support a consistent look-and-feel across platforms with less effort, easier maintenance, and a better reach to a broader set of users. In this course, we will focus on one cross-platform framework, React Native, which builds on JavaScript and React JS to wrap native codes and APIs. Mobile development on React Native, therefore, can be achieved using modern web technologies. This course is designed for students with some prior JavaScript programming experiences. Throughout the course, we will continue developing skills around these web technologies to leverage on-device utilities and sensors as well as process data from both external and internal resources.

I590: Data Visualization with Tableau

Data visualization is the graphical representation data through the use of visual elements, such as charts, graphs, and maps. Visualizing data can provide an accessible way for people to see and understand trends, outliers, and patterns in data, and enable better, more data informed decisions. Data visualization is not a new trend as it has been around for centuries, but the development of new data visualization tools, technologies, and techniques has led to the ubiquity of data visualization in the digital world. In this course, we will be learning how to create online, interactive data visualizations using the software Tableau. This software is a leading data visualization tool that is being used widely in many industries to improve organizational performance and to spur data-driven decision-making. The course will primarily focus on hands-on learning of Tableau, but will also include readings and lectures on data visualization theory and best practices.

I590: Data Visualization

From news to cutting-edge scientific papers, from a home office to the largest companies in the world, data visualization is a critical method for revealing patterns in data and telling stories. Because data visualization is indispensable in understanding data, and because data drives more and more decisions, data visualization has become an essential skill for every knowledge worker. This course is an introduction to basic statistical data analysis and visualization. We will learn the fundamentals of data visualization in the context of perception, integrity, design, statistics, types of data, and visualization techniques. The hands-on exercises using the Python stack aim to equip you with practical data visualization skills and they will be an integral part of the course.

I590: Introduction to Virtual Reality
Virtual Reality has applications in fields as diverse as medicine, education, military training, trauma recovery, and artificial intelligence. In this course, students will learn the foundational skills needed to build virtual reality applications. We will focus on software programs for building virtual assets and realistic virtual environments.

I590: Creating Virtual Assets
This course will explore advanced techniques for creating virtual assets for virtual reality applications. Topics include 3D modeling, animation, motion capture, sound capture and editing, materials, textures, shaders, and scripting. Students will learn how to export assets to virtual reality, augmented reality, video, still images, and 3D printed objects.

I590: Disney: Technology, Tourism & Leisure
This course critically examines Disney's use of technology in their theme parks. By the end of the course students will be able to analyze multiple aspects of the creation of "Disney magic" by examining the relationship between technologies, culture, business, design, and storytelling at work within the parks.

I590: Creativity and Innovation in Technology
Creativity and innovation are highly-valued assets and skills, especially in the high-tech fields. Prompted by scientific studies, theories and common practice, this course is going to engage in discussions on how to be a creative thinker, how to work creatively in organizations, and how to manage creativity in organizations.

I590: Product Management
This course will expose students to the discipline of product management, a multidisciplinary profession which demands a holistic perspective in order to shepherd a product from inception to implementation to ensure that it is successful in the market. Students will be required to work on multidisciplinary teams and complete product proposals based on their analysis of an existing or a new product, which will be in the form of both case-based and client-based projects. Each project will require students to analyze the feasibility and long-term viability of a product from a business, design, and engineering perspective.

I590: Creativity and Innovation in Technology
Creativity and innovation are highly-valued assets and skills, especially in the high-tech fields. Prompted by scientific studies, theories and common practice, this course is going to engage in discussions on how to be a creative thinker, how to work creatively in organizations, and how to manage creativity in organizations. This course will be organized in three formats: lectures, case discussions, and in-class creativity exercises. Through lectures, students will learn the major creativity theories, which will include theories of cognitive mechanisms, social aspects of creativity, creativity in organizations, for examples. Case discussion or in-class creativity exercise will be organized to help students to understand the corresponding theories or practice.

Z515: Information Architecture
The backbone of good user experience is findability and discoverability of content. Principles in information architecture applied to digital ecosystems enable users to navigate with ease and intuitively understand categories of information. Traditional systematic structures will be covered, such as classification schemes, ontologies, controlled vocabularies, and thesauri.

This course also reviews research in information science, cognitive science, semiotics, and computer science that has contributed to an understanding of how communities represent, organize, retrieve, and ultimately use information. This research can inform current practices of representation and organization in the design of more effective information systems.

Special Summer LAIDEL Practicum Course

The Luddy Artificial Intelligence Development and Experience Laboratory (LAIDEL) is an on-campus research practicum for Luddy graduate students that allows participants to develop new AI applications or apply existing AI technology to new problems. LAIDEL is a selective program that allows students to build professional work experience while developing the technology of tomorrow.

LAIDEL is perfect for graduate students who are looking to develop their professional skills while interacting with clients and gaining class credits. As part of the LAIDEL practicum, students will have a chance to apply their existing and learn new skills while working on a class project with external organizations and industry partners. The external partners provide a real-world problem specification, which is then assigned to a team of students, along with a mentor from the external partner's organization. The student teams will explore the problem, create and execute a proposed solution, and upon completion will receive academic credit for their experiences. Throughout the course, students will get an opportunity to network with external partners and learn more about their organization and potential careers within it.

During this 6-week summer session, the partners will be Salesforce and Eli Lilly and Company, among others. Projects may include skill building relating to data engineering/data normalization, image processing, digital marketing, user experience design, project management, technical writing, and presentation skills, among others. Students will be matched to specific projects based on a combination of their skills and interests.

This is a variable credit course, which can be taken for 1- 3 credits. Students taking the course for 1 credit will be expected to put in around 9-10 hour of effort per week, those taking 2 credits will be expected to put in around 17-20 hours of effort per week, and students taking it for 3 credits will be expect to put in around 25-27 hours of effort towards the class each week over the course of the 6-week summer session.

In early April, I will be sending out an email to students to gauge their interest in specific projects within the course, so please look out for that. Eli Lilly will also need students to be registered by April 23 2021, so that they can have time to onboard participating students to their internal systems prior to the start of the course.

Thanks to a generous gift to the School by Fred Luddy, we will have a limited number of Luddy Summer MS fellowships to provide to students who have shown academic excellence and are participating in LAIDEL. The fellowship will include funds of $1000 over the course of the summer. Students will be considered for the fellowship based on their cumulative GPA in the MS program, as well as their resume, and a brief 1-page statement by the student of why they should be considered for the award and what they hope to achieve through their participation in the LAIDEL program.

Suggested and Recommended Readings for All of our Community

About the HCI and Design Literatures
Since HCI and Design are dynamic areas of scholarship and practice, there is not a strict canon of classic literature that one can read, once and for all. It is better to read current sources and to keep reading throughout your career. I suggest allotting 2 hours a day to reading from the sources described below and others in addition to the curricular content.

Places to Look First
Check these first:

* *https://dl.acm.org/*
* *https://www.semanticscholar.org/*
* *https://scholar.google.com/*

Places to Browse: ACM Best Papers List
One strategy is to be sure to read the best papers listed here:

> *Jeff Huang's List of Best Papers*

ACM Exemplary Papers
Each of the ACM conferences lists exemplary papers. I recommend looking at these exemplary papers which are constantly being updated in order to be sure your reading about HCI is up to date. ACM SIGCHI conferences are listed here:

> *https://sigchi.org/conferences/upcoming-conferences/*

ACM CHI Exemplary Papers by Thematic Areas
ACM CHI conference papers are grouped by thematic areas called sub-committees that represent a broad view of HCI. Check each of the links to see the exemplary areas for each subcommittee:

* *User Experience and Usability*
* *Specific Applications Areas*
* *Learning, Education, and Families*
* *Interaction Beyond the Individual*
* *Games and Play*
* *Privacy and Security*
* *Visualization*
* *Health*
* *Accessibility and Aging*
* *Design*
* *Interaction Techniques, Devices, and Modalities*
* *Understanding People: Theory, Concepts, Methods*
* *Engineering Interactive Systems and Technologies*
* *Critical and Sustainable Computing*
* *Computational Interaction*

Technology in Practice
In some ways, keeping up with the technology and other sections of major high integrity new sources is the best way to be current. It is important to triangulate these readings—that is, to read

from a great variety of sources in order to see what is important to different constituencies. Notwithstanding, reliable and high integrity sources are key. Here is a list:

* *Technology Section of The Economist*
* *Technology Section of the New York Times*
* *Technology Section of the Guardian*
* *Technology Section of Reuters*
* *Technology Section of the Atlantic*
* *Technology Section of NPR*
* *Technology Section of the Wall Street Journal*
* *Technology Section of the Washington Post*
* *Technology Section of the BBC*
* *The Conversation (A cross between Journalism and Academic Scholarship)*

Pictorials

At the intersection of HCI and Design are pictorials. These are a good source for design inspirations that bridge between scholarship and practice:

* *C&C 2017, 2019*
* *DIS 2014 to 2019*
* *TEI 2020*

Design

There are a number of good **open source** journals about Design:

* *She Ji: The Journal of Design, Economics, and Innovation*
* *IJD: International Journal of Design*

Additional Resources

Here are some additional useful links:

* *NN/g UX research reports*
* *PHD-Design Listserv*

Independent Studies

This text was originally written by Erik Stolterman and remains in effect.

Independent studies (IS) present opportunities for students to create learning experiences when there is no formal course available about a particular topic. The success of an IS depends on some preconditions and also requires a process and some documents. An Independent Study is a privilege, not a right: A student needs to find a faculty member who agrees to be the advisor and who will grade the work. The student also needs to present a sufficient plan (syllabus) for the IS (see below).

Faculty Members are not obligated to advise independent studies, and the work receives very little recognition from the school. The reason a professor would accept to serve as an advisor is that the topic is of interest to the professor, and the advisor wants to work with a particular student, based on earned rapport.

Teams
Students may propose an independent study alone, or as a team of two, but no more than two.

Use the following process to establish an independent study:

1. The student(s) need to develop an idea and present the idea to potential faculty advisors.
2. A professor needs to be willing to accept the role of advisor for the proposed Independent Study.
3. The student(s) need to write an independent study syllabus that is approved by the advisor.
4. The student(s) need to register for an independent study and attach the syllabus to the independent study form.

The independent study description or syllabus
A syllabus has to contain the following sections:

A title that describes the work (similar to a course name).

A section that describes the topic, why is has been chosen, why it is important for the student(s), and how it will contribute to the students' overall education.

1. A section that clearly describes the learning out- come of the independent study.
2. A section that describes the activities that will constitute the main work during the independent study.
3. A section that lists the readings that will be part of the independent study.
4. A section that describes the outcomes (papers, designs, prototypes, etc.) of the independent study.
5. A section that describes how and what will be graded and a deadline for when the final material will be delivered.
6. A fairly detailed plan for the semester, with planned activities, readings, outcomes, and so forth—roughly similar to a course schedule.
7. At the end of the independent study, the student(s)need to give the material that will be graded to the advisor, in a well-organized form.

Internships

Internships meeting the criteria I state below are endorsed by our MS HCI/d program. We consider them integral to the program, as the program has a strong professional orientation. We do not require them as part of our curriculum only because we cannot guarantee that every student will be offered an internship. Nonetheless, we strongly encourage every student who is offered an opportunity for an internship meeting our criteria to integrate such internships into her or his or their program of study.

The criteria for an internship that forms an essential part of studies towards an MS Informatics in HCI/d degree are:

Topics
The internship must offer opportunities to develop skills in human-computer interaction (HCI), interaction design (IxD), experience design (Ux or UxD), strategic design planning. These include technical skills such as interface design, App design, virtual reality (VR), augmented reality (AR), modeling in 2D or 3D, typography and graphic design, and so forth. Topic areas include but are not limited to the following:

- User Experience and Usability
- Specific Applications Areas
- Learning, Education, and Families
- Interaction Beyond the Individual
- Games and Play
- Privacy and Security
- Visualization
- Health
- Accessibility and Aging
- Design
- Interaction Techniques, Devices, and Modalities
- Understanding People: Theory, Concepts, Methods
- Engineering Interactive Systems and Technologies
- Critical and Sustainable Computing
- Computational Interaction

Students may apply to receive credit for their internships according to the criteria outlined in our policy:

Internships with Credit
Many students have the opportunity to do an internship during their studies. It is possible for a student to receive course credits for an internship. Such credits are available only when there is a clear learning experience that extends above and beyond what would be considered normal for the practical experience anyone gets from any internship, in general. To be able to receive credits for an internship means that there has to be special learning possibilities entailed in the particular internship in question. To earn credits, the student needs to make a well-argued case that her or his internship is special in some way, and that it will lead to learning experiences that equal those of a formal course. This means that practical experience is not enough. To reach the same level of learning outcome as a course, the practical experience has to be combined with readings in the field, and reflection that relates reading with the practical experience.

An internship for credit also requires that the student has an advisor in the organization in which the internship takes place. The advisor has to agree to be the advisor and to take the responsibility for advising the student. The advisor should also agree to be a contact person with the academic advisor. It is the student's responsibility to find a faculty member who is willing to serve as the academic advisor. An internship for credits also has to result in a written document that describes the practical experience, summarizes and comments on the readings, and relates them to each other. The document should be well argued, well referenced, complete, produced with high production values, and possibly be published. The final document will be graded by the academic advisor. The academic advisor must receive input from the organizational advisor on the quality of the work of the student. Such internships may be taken under the course number I591, I798, or as part of I694.

Internships without Credit

A student may also take on an internship without credit and such an internship may be considered to be integral to our program if it meets the criteria under the heading *Topics* above. An internship without credit does not require the formal supervision and reporting described under the titled section *Internships with Credit.* Such internships may be taken under the course number I591, I798, or as part of I694.

Unpaid Internships

Our program does not endorse nor recommend unpaid internships. Such internships are not integral to the program under any circumstances.

Timing and Other Constraints

Internships may run concurrently with classes provided only that students meet all of their study obligations in each and every enrolled class. Internships may also be related and integrated with work in I694 capstone thesis classes according to the judgement of the instructors when the internship is closely related to the project themes. Internships must not interfere with a student's ability to graduate on time. International students must secure necessary permissions through the Office of International Students (OIS) whose word on these matters is final as a matter of legal compliance.

Number of Internships

For international students, the first internship is nearly always approved. The second one is typically approved with sufficient documentation per the criteria above. A third is very difficult to approve and the student is expected to provide all of the necessary documentation and evidence herself or himself or themself.

Protocol

If you have been offered a second internship and want to count it as integral to your degree, kindly write a statement detailing exactly what you will be doing in your internship, how it conforms to the criteria described above under the title *Topics*, and how you want the internship to fit into your studies—either as I591 or I798, or as an engagement which informs your Capstone I694 studies.

If you are an international student, we will need to file your request with OIS. In this case, your statement must also provide an account of how this internship differs from prior internships and what you will learn that you did not learn in prior internships. OIS looks for the following information when approving a second curricular practical training (CPT):

> *Please list the specific differences in duties between this internship and any prior internships. The more information, the better. You should include information such as (a) what you might have*

special access to or the opportunity you will have in the second part of your internship that you wouldn't necessarily have exposure to in your classes and (b) how that would differ than the first part of your internship. Is there a specific technology, a set of data or population or use of specific methods you would gain, for example? How will your new internship fit into the thematic areas listed earlier in this letter?

Kindly specify if and how many credits you are expecting to receive for your internship. Send your statement to Luddy Graduate Advising *gradvise@indiana.edu* and to the MS HCI/d program director. The director will either endorse your request or ask for more information or decline to endorse your request. With the endorsement, Luddy Graduate Advising will fill in the appropriate request to OIS and file the form with them. OIS will make a decision which will be final.

If you are an international student seeking approval for an internship beyond the second one, please be aware that these are rarely approved. Your statement will have to be especially compelling. It is your responsibility to make the argument and evidence persuasively in a form that can be endorsed by the director and entered in the appropriate forms by Luddy Graduate Advising. Again, please use the criteria listed under *Topics* above as a guide.

PhD Curriculum Map

This text was originally written by Jeff Bardzell, HCI/d program director 2016-2020 and remains in effect.

Summary
Human-computer interaction (HCI) has traditionally been the domain of engineering and psychology. Here, we approach it from the perspective of design. That is, we focus on the ways that design and research cooperate to create openings and insights into emerging design domains; how research contributes to design processes and methods; and how design practices can themselves be a form of research.

Human-computer interaction design research is more geared toward supporting technology enabled interventions—toward bringing about better possible futures—than about describing the past or even the present. It asks, what possible futures are open to us, and how might we pursue them? What is "design thinking" and what methods best support design activities? How might information technology be developed in service of social justice and sustainability? How can design professions be more participatory and democratic? What makes user experiences aesthetic, and how can designers create them?

Human computer interaction design opens up possibilities, such as the following: massive scale collaborative systems like Wikipedia; global hardware/fabrication networks, as seen, for example, in the maker movement; educational applications of augmented and virtual reality; new forms of democratic participation in government; innovations in everyday life, such as personal health tracking; and entertainment computing, such as videogames. But interactive systems also contribute to serious social problems, such as e-waste and environmental destruction; concerns about privacy and surveillance; and unequal access due to socioeconomic status, disability, and other social issues. HCI/d research seeks to understand such opportunities and problems in a way that equally attends to emerging technological possibilities, studies of human needs, and sociocultural contexts and trends—in a way that is oriented toward intentional intervention, that is, design.

The human-computer interaction design track of the Ph.D. in Informatics offers the opportunity to conduct practical research in these areas:

- Interaction design
- Computer-supported cooperative work (CSCW) and social computing
- New media
- Dynamic visualizations
- ICT for Development
- Augmented reality
- Learning systems
- Design pedagogy
- Tangible and embodied interaction (TEI)
- Ubiquitous computing
- Mobile computing
- Political economy of computing

Required Courses

All courses provided by faculty in the Human-Computer Interaction Design track, including the I609 and I709 Advanced Seminars, are open to and welcome students from other tracks and programs.

I609 Advanced Seminar I in Human-Computer Interaction Design

This course combines the traditional seminar format with research skills-oriented sessions. Together, we survey contemporary research in the field of human-computer interaction design and design research. We discuss core aspects of research practice, including research questions and contributions, methods, and theory. We also have practical sessions on how to conduct peer review, write academic papers, and conduct literature reviews.

This course is required of all HCID Ph.D. students (fulfilling one of the two seminar requirements) and is open to Ph.D. students from other tracks as well.

I709 Advanced Seminar II in Human-Computer Interaction Design

The second seminar in human-computer interaction design is a continuation of the first and follows the same structure.

Elective Courses

In addition to required courses, students should take at least 12 elective credits for the doctoral degree. This list is illustrative and not exclusive.

- I528 – Participatory Design
- I530 – Field Deployments
- I541 – Interaction Design Practice (Soon to be renamed Introduction to HCI/d)
- I542 – Foundations of HCI
- I543 – Interaction Design Methods
- I544 – Experience Design
- I549 – Advanced Prototyping
- I561 – Visual Thinking Meaning and Form
- I590 – Various (e.g., Augmented Reality; Design Strategy; Interaction Culture; Social Computing; Sustainability in HCI and Design; Visual Foundations for HCI)
- I604 – HCI Design Theory – Stolterman

Qualifying Exam

Written and oral examinations will be decided by the student's committee based on his or her research interests. A typical exam consists of an extensive annotated bibliography with accompanying critical essay that describes the student's interpretation of the relevant literature and how they situate their own interests and work within it. The written portion of the exam is followed by an oral exam to defend the written submissions.

Typical Minors

Inquiry methodology, cognitive science, anthropology, sociology, intelligent and interactive systems, computing, culture, and society.