



IUPUI

## SCHOOL OF INFORMATICS AND COMPUTING

DEPARTMENT OF HUMAN-CENTERED COMPUTING  
Indiana University–Purdue University  
Indianapolis

### I575 Informatics Research Design

Department of Human-Centered Computing  
Indiana University School of Informatics and Computing, Indianapolis  
Fall 2016

Syllabus **version 1.3** (August 31, 2016)

*The most current version of the syllabus will always be on Canvas.  
Please check Canvas first to make sure you have the newest syllabus!*

*Credit Hours:* 3

*Time:* Mondays, 6-8:40pm

*Location:* IT 497, Informatics & Communications Technology Complex  
535 West Michigan Street, Indianapolis, IN 46202

*First Class:* August 22, 2016

*Website:* <https://iu.instructure.com/courses/1576983>

*Instructor:* Dr. Andrew D Miller, PhD – Assistant Professor

*Prerequisites:* None (Not an extension of any undergraduate or graduate course)

*Timetable:* 6:00-6:55

Lecture by instructor

7:00 to 7:55

Student-led discussion

8 to 8:40

Practicum: In-class exercises & presentations

### COURSE DESCRIPTION

The course provides students with a broad overview of the fundamental research methods in HCI and related areas, introducing students to various types of research approaches, research designs, including hypothesis-driven research, exploratory research, and empirical research approaches, both qualitative and quantitative. The course provides the conceptual framework in which informatics graduate students may develop their own research agenda. Students will engage with multiple research techniques through readings and discussion. Students will also prepare and receive feedback on a research proposal.

### EXTENDED COURSE DESCRIPTION

In this course, you will learn about a broad array of research design approaches in informatics, with a focus on those used in HCI and related fields. For each approach, we will cover the types of questions the approach enables, the research methods and data gathered by those who use the approach in their own research, and examine successful examples of the research design approach

in action. As an overview course, the content ranges from philosophical foundations to practical applications: you will learn both *why* one might choose certain research designs and *how* those designs are implemented in real research studies.

In parallel, you will begin to find your own way within the scope of informatics research design, proposing a research project and ‘road-testing’ one or more of the research techniques discussed in class through the development of a research proposal. By doing so, you will begin to develop your own independent research agenda.

### **Intended students:**

This course is intended for all graduate students planning to undertake research in an area related to informatics. This section of the course is particularly designed for students studying Human-Computer Interaction and Media Arts and Sciences. Depending on their majors, students will hold undergraduate degrees in a wide range of disciplines in the arts and sciences, as well as medicine and nursing. Most of the students will have little or no experience conducting research. This course is intended as preparatory to undertaking research projects for Master’s theses and doctoral dissertations.

### **Purpose of Course and General Information:**

The purpose of I575 is to prepare you to design empirical research studies, to analyze the data you collect, and ultimately to write a thesis. In this course, you will learn these skills by preparing a research proposal on a topic of your choice, and filling it out throughout the semester. This research proposal will form the bulk of your grade in the course. You may choose any topic, as long as it fits into the areas of HCI or Media Arts & Sciences. The topic need not be your thesis topic, but the closer you can get the more helpful this class will be! In addition to preparing your own research proposal, you will read and learn to dissect published research papers in HCI, lead class discussion, and provide peer feedback on each other’s working drafts.

### **Required Text(s):**

Title:	Ways of Knowing in HCI
Author(s):	Judith S Olson and Wendy Kellogg, Editors
Publisher:	Springer
Book site:	<a href="http://www.springer.com/us/book/9781493903771">http://www.springer.com/us/book/9781493903771</a>
ISBN:	978-1-4939-0378-8

Free to read while online & logged in	<a href="http://iucat.iu.edu/catalog/14032120">http://iucat.iu.edu/catalog/14032120</a>
Hardcover: (≈\$60 used, \$80 new)	<a href="https://amzn.com/1493903772">https://amzn.com/1493903772</a>
Kindle: (≈\$36 to rent, \$60 to buy)	<a href="https://amzn.com/B00JT3PZEA">https://amzn.com/B00JT3PZEA</a>

### **Additional Readings: (if required)**

Additional weekly readings will be posted as PDFs or links on the course website.

### **Teaching and Learning Methods**

Lecture, Discussion, Presentation & Written Articulation

## **EXPECTATIONS, GUIDELINES, AND POLICIES**

### **Attendance:**

A basic requirement of this course is that you will participate in all class meetings, whether online or face-to-face, and conscientiously complete all required course activities and assignments. Class attendance is required for classroom-based courses. It entails being present and attentive for the entire class period. Attendance shall be taken in every class. If you do not sign the attendance sheet while in class, you shall be marked absent. Signing the attendance sheet for another student is prohibited. The instructor is required to submit to the Registrar a record of student attendance, and action shall be taken if the record conveys a trend of absenteeism.

Only the following are acceptable excuses for absences: death in the immediate family (e.g. mother, father, spouse, child, or sibling), hospitalization or serious illness; jury duty; court ordered summons; religious holiday; university/school coordinated athletic or scholastic activities; an unanticipated event that would cause attendance to result in substantial hardship to one's self or immediate family. Absences must be explained with the submission of appropriate documentation to the satisfaction of the instructor, who will decide whether missed work may be made up. Absences that do not satisfy the above criteria are considered unexcused. To protect your privacy, doctor's excuses should exclude the nature of the condition and focus instead on how the condition impacts your attendance and academic performance.

Missing class reduces your grade through the following grade reduction policy: You are allowed two excused or unexcused absences. Each additional absence, unless excused, results in a 5% reduction in your final course grade. More than four absences result in an F in the course. Missing class may also reduce your grade by eliminating opportunities for class participation. For all absences, the student is responsible for all covered materials and assignments.

### **Incomplete:**

The instructor may assign an Incomplete (I) grade only if at least 75% of the required coursework has been completed at passing quality and holding you to previously established time limits would result in unjust hardship to you. All unfinished work must be completed by the date set by the instructor. Left unchanged, an Incomplete automatically becomes an F after one year. <http://registrar.iupui.edu/incomp.html>

### **Deliverables Policy:**

You are responsible for completing each deliverable (e.g., assignment, quiz) by its deadline and submitting it by the specified method. Deadlines are outlined in the syllabus or in supplementary documents accessible through Canvas. Should you miss a class, you are still responsible for completing the deliverable and for finding out what was covered in class, including any new or modified deliverable. In fairness to the instructor and students who completed their work on time, a grade on a deliverable shall be reduced 10%, if it is submitted late and a further 10% for each 24-hour period it is submitted after the deadline.

**Grading Information:**

- 60% research proposal + presentation
  - 10% Annotated bibliography
  - 40% Final proposal document (rubric to be distributed)
  - 10% Final proposal presentation
- 10% Participation  
(online: respond to prompts from the week's leader **by** Monday morning/  
offline: participate in discussions)
- 10% Topic paper presentation  
(online: prepare & submit prompts for your week, offline: lead discussions)
- 5% Draft for peer review
- 5% Peer review of classmate's draft proposal

**YOUR DELIVERABLES / EXPECTED EFFORT**

- Final deliverable: Write a 10-15 page research proposal (11pt single-spaced)
- Regularly participate in Canvas and in-class discussions
- Read weekly chapters/papers (this is the bulk of your weekly homework)
- Present a paper from a given research topic and guide class discussion
- Provide peer review for others' research proposals

**Research Proposal:**

This is your chance to take a research idea and turn it into a workable proposal! Ideally, this class will allow you to craft a proposal for a MS Thesis or initial PhD project, however any reasonable HCI research area or question will do. Most of us will use the NSF research proposal format, but with permission you may choose to format your proposal for another agency (such as an NIH call) or funding source (such as a foundation). I will help you choose a topic and provide feedback several times throughout the semester. You will also receive feedback from your peers. At the end of the semester, you will present your research proposal to the class. Your proposal should include a 1-page overview as well as an additional 10-15 page description of your proposed work (11pt single spaced).

Irrespective of format, your proposal should contain the following:

- Research Objective
- Research Questions
- Related Work (and gaps)
- Methods
- Procedures
- Participants
- Timeline

**Topic paper presentation:**

Each week, a student will lead discussion on a published research paper relevant to the week's topic. Students will sign up for these slots during the first few weeks of class. Students will:

- Prepare a motivating question or two in advance and post them to Canvas for other students to react to. **Post this question by Wednesday morning** the week before.
- Prepare a brief oral overview of the paper (a minute or two of oral presentation, NO slides) and guiding questions for discussion.

*Advice for topic paper presentations:*

- Your goal is to be the lead discussant, not to know all the answers!
- Be the most knowledgeable person in the room about your paper
- There WILL be awkward silences! Be prepared with guiding questions to re-start discussion. I'll help out with this, but you will learn more if you take the lead!
- Guide your peers through the paper. Sample prompts for in-class discussion:
  - What is the situation in which the data are collected?
  - What do the data consist of?
  - What kind(s) of analyses are performed on the data to generate "knowing?"
  - What kinds of questions can this method answer (and what not)?
  - How well have the authors implemented the method?
  - What is good about this paper? What would you improve?
  - What would you do next?
  - What other methods could be applied to this problem?

**WEEKLY SCHEDULE****Structure of a typical class:**

- Before class: read chapter & topic paper, post questions/reactions on Canvas
- Weekly lecture/overview on the week's Ways of Knowing chapter
- Topic paper discussion, led by student(s)
- Interactive/lab time (either we try out the method, I lecture on the next phase of our research proposals, or we have lab time to work on your proposals)

<b>Date</b>	<b>Topic</b>	<b>Readings</b>	<b>Deliverables</b>
8/22	Ways of Knowing	None!	
8/29	Science & Design	<i>Ways of Knowing:</i> Science and Design: The Implications of Different Forms of Accountability (Gaver)  <i>Topic paper:</i> How HCI Interprets the Probes (Boehner et al. 2007)	[9/6] Submit topic area through Canvas, Andrew will follow up via email
9/5	<b><i>NO CLASS (Labor Day)</i></b>		

<b>Date</b>	<b>Topic</b>	<b>Readings</b>	<b>Deliverables</b>
9/12	Experimental Research in HCI  Information Literacy (Willie Miller)	<i>Ways of Knowing:</i> Experimental Research in HCI (Gergle & Tan) <i>Topic paper:</i> Effects of four computer-mediated communications channels on trust development (Bos, Olson, Gergle, Olson, Wright)	
9/19	Ethnography	<i>Ways of Knowing:</i> Reading and Interpreting Ethnography (Dourish) <i>Topic paper:</i> A Hybrid Cultural Ecology: World of Warcraft in China (Lindtner et al.)	[9/19] Annotated bibliography
9/26	Technical HCI	<i>Ways of Knowing:</i> Concepts, Values, and Methods for Technical Human- Computer Interaction Research (Hudson & Mankoff)  <i>Topic paper:</i> TBD	[9/26] Related work
10/3	Qualitative Analysis	<i>Ways of Knowing:</i> Curiosity, Creativity, and Surprise as Analytic Tools: Grounded Theory Method (Muller) <i>Topic paper:</i> TBD	[10/3] Detailed outline
10/10	Sensor Data	<i>Ways of Knowing:</i> Sensor Data Streams (Voida, Patterson, Patel) <i>Topic paper:</i> TBD	[10/10] Draft for peer review
10/17	<b>NO CLASS (Fall Break)</b>		
10/24	Online Communities	<i>Ways of Knowing:</i> Study, Build, Repeat: Using Online Communities as a Research Platform (Terveen, Konstan, Lampe) <i>Topic paper:</i> TBD	[10/24] Peer review constructive critique

<b>Date</b>	<b>Topic</b>	<b>Readings</b>	<b>Deliverables</b>
10/31	Field Deployments	<p><i>Ways of Knowing:</i> Field Deployments: Knowing from Using in Context (Siek, Hayes, Newman, Tang)</p> <p><i>Topic paper:</i> Persuasive Technology in the Real World: A Study of Long-Term Use of Activity Sensing Devices for Fitness (Fritz, Huang, Murphy, Zimmerman)</p>	
11/7	Survey Research	<p><i>Ways of Knowing:</i> Survey Research in HCI (Müller, Sedley, Ferrall-Nunge)</p> <p><i>Topic paper:</i> Who Has the Force? Solving Conflicts for Multi User Mid-Air Gestures for TVs (Plaumann, Lehr, Rukzio)</p>	
11/14	Log Data Analysis	<p><i>Ways of Knowing:</i> Understanding User Behavior Through Log Data and Analysis (Dumais et al.)</p> <p><i>Topic paper:</i> TBD</p>	[11/14] Draft research proposal
11/21	Interviewing	<p><i>Ways of Knowing:</i> Looking Back: Retrospective Study Methods for HCI (Russell, Chi)</p> <p><i>Topic paper:</i> TBD</p>	
11/28	Research Ethics	<p><i>Ways of Knowing:</i> Research Ethics and HCI (Bruckman)</p> <p><i>Topic paper:</i> Experimental evidence of massive-scale emotional contagion through social networks (Kramer, Guillory, Hancock)</p>	Final research proposal due
12/5	Final Presentations	None!	Final presentation

**Grading Scale:**

A+	97 – 100	Outstanding achievement, given at the instructor’s discretion
A	93 – 96.99	Excellent achievement
A–	90 – 92.99	Very good performance and quality of work
B+	87 – 89.99	Good performance and quality of work
B	83 – 86.99	Modestly acceptable performance and quality of work
B–	80 – 82.99	Marginal acceptable performance and quality of work
C+	77 – 79.99	Unacceptable work (Course must be repeated for credit)
C	73 – 76.99	Unacceptable work (Course must be repeated for credit)
C–	70 – 72.99	Unacceptable work (Course must be repeated for credit)
D+	67 – 69.99	Unacceptable work (Course must be repeated for credit)
D	63 – 66.99	Unacceptable work (Course must be repeated for credit)
D–	60 – 62.99	Unacceptable work (Course must be repeated for credit)
F	Below 60	Unacceptable work (Course must be repeated for credit)

No credits toward major, minor, or certificate requirements are granted for a grade below B–.

**CODE OF CONDUCT**

All students should aspire to the highest standards of academic integrity. Using another student’s work on an assignment, cheating on a test, not quoting or citing references correctly, or any other form of dishonesty or plagiarism shall result in a grade of zero on the item and possibly an F in the course. Incidences of academic misconduct shall be referred to the Department Chair and repeated violations shall result in dismissal from the program.

All students are responsible for reading, understanding, and applying the *Code of Student Rights, Responsibilities and Conduct* and in particular the section on academic misconduct. Refer to *The Code > Responsibilities > Academic Misconduct* at <http://www.indiana.edu/~code/>. All students must also successfully complete the Indiana University Department of Education “How to Recognize Plagiarism” Tutorial and Test. <https://www.indiana.edu/~istd> You must document the difference between your writing and that of others. Use quotation marks in addition to a citation, page number, and reference whenever writing someone else’s words (e.g., following the *Publication Manual of the American Psychological Association*). To detect plagiarism instructors apply a range of methods, including Turnitin.com. <http://www.ulib.iupui.edu/libinfo/turnitin>

**Academic misconduct:**

1. **Cheating:** Cheating is considered to be an attempt to use or provide unauthorized assistance, materials, information, or study aids in any form and in any academic exercise or environment.
  - a. A student must not use external assistance on any “in-class” or “take-home” examination, unless the instructor specifically has authorized external assistance. This prohibition includes, but is not limited to, the use of tutors, books, notes, calculators, computers, and wireless communication devices.
  - b. A student must not use another person as a substitute in the taking of an examination or quiz, nor allow other persons to conduct research or to prepare work, without advanced authorization from the instructor to whom the work is being submitted.
  - c. A student must not use materials from a commercial term paper company, files of papers prepared by other persons, or submit documents found on the Internet.
  - d. A student must not collaborate with other persons on a particular project and submit a copy of a written report that is represented explicitly or implicitly as the student’s individual work.

- e. A student must not use any unauthorized assistance in a laboratory, at a computer terminal, or on fieldwork.
  - f. A student must not steal examinations or other course materials, including but not limited to, physical copies and photographic or electronic images.
  - g. A student must not submit substantial portions of the same academic work for credit or honors more than once without permission of the instructor or program to whom the work is being submitted.
  - h. A student must not, without authorization, alter a grade or score in any way, nor alter answers on a returned exam or assignment for credit.
2. **Fabrication:** A student must not falsify or invent any information or data in an academic exercise including, but not limited to, records or reports, laboratory results, and citation to the sources of information.
  3. **Plagiarism:** Plagiarism is defined as presenting someone else's work, including the work of other students, as one's own. Any ideas or materials taken from another source for either written or oral use must be fully acknowledged, unless the information is common knowledge. What is considered "common knowledge" may differ from course to course.
    - a. A student must not adopt or reproduce ideas, opinions, theories, formulas, graphics, or pictures of another person without acknowledgment.
    - b. A student must give credit to the originality of others and acknowledge indebtedness whenever:
      1. directly quoting another person's actual words, whether oral or written;
      2. using another person's ideas, opinions, or theories;
      3. paraphrasing the words, ideas, opinions, or theories of others, whether oral or written;
      4. borrowing facts, statistics, or illustrative material; or
      5. offering materials assembled or collected by others in the form of projects or collections without acknowledgment
  4. **Interference:** A student must not steal, change, destroy, or impede another student's work, nor should the student unjustly attempt, through a bribe, a promise of favors or threats, to affect any student's grade or the evaluation of academic performance. Impeding another student's work includes, but is not limited to, the theft, defacement, or mutilation of resources so as to deprive others of the information they contain.
  5. **Violation of course rules:** A student must not violate course rules established by a department, the course syllabus, verbal or written instructions, or the course materials that are rationally related to the content of the course or to the enhancement of the learning process in the course.
  6. **Facilitating academic dishonesty:** A student must not intentionally or knowingly help or attempt to help another student to commit an act of academic misconduct, nor allow another student to use his or her work or resources to commit an act of misconduct.

#### **OTHER POLICIES**

1. **Administrative withdrawal:** Students must participate in all class discussions and conscientiously complete all required course activities and/or assignments. If a student is unable to attend, participate in, or complete an assignment on time, the student must inform the instructor. If a student misses more than half of the required activities within the first 25% of the course without contacting the instructor, the student may be administratively withdrawn from this course. Administrative withdrawal may have academic, financial, and financial aid implications. Administrative withdrawal occurs after the full refund period, and a student who has been administratively withdrawn is ineligible for a tuition refund.

2. **Civility:** To maintain an effective and inclusive learning environment, it is important to be an attentive and respectful participant in lectures, discussions, group work, and other classroom exercises. Thus, unnecessary disruptions should be avoided, such as ringing cell phones, engagement in private conversations, and other unrelated activities. Cell phones, media players, or any noisy devices should be turned off during a class. Texting, web surfing, and posting to social media are generally not permitted. Laptop use may be permitted if it is used for taking notes or conducting class activities. Students should check with the instructor about permissible devices in class. IUPUI nurtures and promotes “a campus climate that seeks, values, and cultivates diversity in all of its forms and that provides conditions necessary for all campus community members to feel welcomed, supported, included, and valued” (IUPUI Strategic Initiative 9). IUPUI prohibits “discrimination against anyone for reasons of race, color, religion, national origin, sex, sexual orientation, marital status, age, disability, or veteran status” (Office of Equal Opportunity). Profanity or derogatory comments about the instructor, fellow students, invited speakers or other classroom visitors, or any members of the campus community shall not be tolerated. A violation of this rule shall result in a warning and, if the offense continues, possible disciplinary action.
3. **Communication:** For classroom-based courses, the instructor or teaching assistant should respond to emails by the end of the next class or, for online courses, within two Indiana University working days, which excludes weekends and holidays. The instructor should provide weekly office hours or accept appointments for face-to-face, telephone, or teleconferenced meetings, and announce periods of extended absence in advance.
4. **Counseling and Psychological Services (CAPS):** Students seeking counseling or other psychological services should contact the CAPS office at 274-2548 or capsindy@iupui.edu. For more information visit <http://life.iupui.edu/caps/>.
5. **Course evaluations:** Course evaluations provide vital information for improving the quality of courses and programs. Students are urged to complete one course and instructor evaluation for each section in which they are enrolled at the School of Informatics and Computing with the following exceptions: (a) The student has withdrawn from the course; (b) fewer than five students are enrolled in the section (in which case maintaining anonymity is difficult); and (c) the section is a laboratory that must be taken with a course having a different section number. Course evaluations are completed at <https://soic.iupui.edu/app/course-eval/>. Course evaluations are typically open from the eleventh week. Course evaluations are anonymous, which means that no one can view the name of the student completing the evaluation. In addition, no one can view the evaluation itself until after the instructor has submitted the final grades. In small sections, demographic information should be left blank, if it could be used to identify the student.
6. **Disabilities policy:** All qualified students enrolled in this course are entitled to reasonable accommodations for a disability. Notify the instructor during the first week of class of accommodations needed. Students requiring accommodations register with Adaptive Educational Services (AES) and complete the appropriate AES-issued before receiving accommodations. The AES office is located at UC 100, Taylor Hall (Email: [aes@iupui.edu](mailto:aes@iupui.edu), Tel. 317 274-3241). For more information visit <http://aes.iupui.edu>.
7. **Email:** Indiana University uses your IU email account as an official means of communication, and students should check it daily. Although you may have your IU email forwarded to an outside email account, please email faculty and staff from your IU email account.
8. **Emergency preparedness:** Know what to do in an emergency so that you can protect yourself and others. For more information, visit the emergency management website at <http://protect.iu.edu/emergency>.
9. **IUPUI course policies:** A number of campus policies governing IUPUI courses may be found at the following link: [http://registrar.iupui.edu/course\\_policies.html](http://registrar.iupui.edu/course_policies.html)

10. **No class attendance without enrollment.** Only those who are officially enrolled in this course may attend class unless enrolled as an auditor or making up an Incomplete by prior arrangement with the instructor. This policy does not apply to those assisting a student with a documented disability, serving in an instructional role, or administrative personnel. <http://registrar.iupui.edu/official-enrollment-class-attendance.html> Children may *not* attend class with their parents, guardians, or childcare providers.
11. **Religious holidays:** Students seeking accommodation for religious observances must submit a request form to the course instructor by the end of the second week of the semester. For information visit <http://registrar.iupui.edu/religious.html>.
12. **Right to revise:** The instructor reserves the right to make changes to this syllabus as necessary and, in such an event, will notify students of the changes immediately.
13. **Sexual misconduct:** IU does not tolerate sexual harassment or violence. For more information and resources, visit <http://stopsexualviolence.iu.edu/>.
14. **Student advocate:** The Student Advocate assists students with personal, financial, and academic issues. The Student Advocate is in the Campus Center, Suite 350, and may also be contacted at 317 274-4431 or [studvoc@iupui.edu](mailto:studvoc@iupui.edu). For more information visit <http://studentaffairs.iupui.edu/advocate>.

### MISSION STATEMENT

The Mission of IUPUI is to provide for its constituents excellence in

- Teaching and Learning;
- Research, Scholarship, and Creative Activity; and
- Civic Engagement.

With each of these core activities characterized by

- Collaboration within and across disciplines and with the community;
- A commitment to ensuring diversity; and
- Pursuit of best practices.

IUPUI's mission is derived from and aligned with the principal components—Communities of Learning, Responsibilities of Excellence, Accountability and Best Practices—of Indiana University's Strategic Directions Charter.

### STATEMENT OF VALUES

IUPUI values the commitment of students to learning; of faculty to the highest standards of teaching, scholarship, and service; and of staff to the highest standards of service. IUPUI recognizes students as partners in learning. IUPUI values the opportunities afforded by its location in Indiana's capital city and is committed to serving the needs of its community. Thus, IUPUI students, faculty, and staff are involved in the community, both to provide educational programs and patient care and to apply learning to community needs through service. As a leader in fostering collaborative relationships, IUPUI values collegiality, cooperation, creativity, innovation, and entrepreneurship as well as honesty, integrity, and support for open inquiry and dissemination of findings. IUPUI is committed to the personal and professional development of its students, faculty, and staff and to continuous improvement of its programs and services.