I. Course Description (50 words)
Focused on methods for designing for and with people in an increasingly cyber-physical world, with its many challenges and opportunities. Course topics include: design ideation, personas, scenarios, “WoZ,” rapid prototyping, collaborative design, observations, interviews, surveys, heuristic evaluation, usability engineering, and “RtD.” While the methods considered apply to design broadly, Interaction Design, User Experience Design, and HCI are emphasized.

II. Background and Definitions
In the act of designing artifacts (e.g. objects, buildings, book covers, …), a designer or design team typically anticipates how people will engage (use, interpret) them. In designing interactive artifacts (those that may be virtual, smart, intelligent, cyber-physical), there is a fundamental difference: designers are developing responsive systems that actively engage and interact with inhabitants, local conditions, and/or digital information in real time. Unlike a typical, designed object that exhibits a limited range of responses to dynamic, changing conditions, an interactive artifact is intimately bound together with its users and local conditions in a designed performance.

“Interaction designers” are designers who design not only things but also the interaction of things and the people who use them. Consequently, interaction designers must go beyond simplistic, form-making and composition; interaction designers must explore ways for improving life, enhancing existing places, and supporting the interaction of human beings with their physical (and digital) surroundings.

Interaction Designers combine design, technology, and an attentiveness to human needs and desires to make cyber-physical ecosystems supporting human activity. Specifically, “Human Centered Design Methods” focuses on the iterative, human centered, design-research process of developing meticulously designed, computationally-embedded, artifacts that support and enhance the interactions across people and their surroundings to create places of social and psychological significance. The gradual embedding of computation in designed artifacts will have a broad impact on society as these technologies support and, in some cases, augment everyday work, school, entertainment, and leisure. In brief, Interaction Design is more than an aesthetic search, a stylistic possibility, a utopian dream, or a technological quest; it is, instead, a way of designing a “commodious home” for established and new patterns of living. In the words of philosopher Andrew Feenberg, “technology,” in this context, “is not simply a means but has become an environment, a way of life.”
III. Course Objectives and Learning Outcomes
“Human Centered Design Methods” aims to cultivate new vocabularies of design and new, complex realms of understanding towards realizing artifacts and systems responsive to human needs and desires. By the completion of this course, student will:
• cultivate an understanding of how human-centric design methodologies can be applied in the iterative process of designing artifacts supporting and augmenting human users.
• demonstrate an ability to develop and test conceptual design prototypes responsive to the challenges and opportunities of an increasingly digital society.
• communicate a design process in a rigorous written paper, poster, design diary, and video, adhering to the requirements for submission to the benchmark conference for human-centered, interaction design research: CHI, “Late Breaking Work” submission, https://chi2018.acm.org/authors/late-breaking-work/ and the “Video Showcase” submission, https://chi2018.acm.org/authors/video-showcase/.

IV. Course Materials
READING MATERIALS
Downloadable readings and support materials for this course, including this syllabus, are found at https://arl.human.cornell.edu/DEA2730%20HCDM.htm. The following book is essential:

HINT: Ahead of class, skim-read the assigned readings listed as “READ” under the class session for that given day; in class, listen and take notes to learn what is emphasized; following class, re-read the readings for detail knowing the emphasis from the class session.

A book that provides thorough case studies of the methods presented in this course is my own book which is not required for this course but suggested:

Additionally, you may find useful this brief introduction to interaction design: Winograd, Terry. “From Computing Machinery to Interaction Design.”

PROTOTYPING MATERIALS
In this class you will be prototyping iteratively. You will need to purchase the materials required to construct your prototype (some materials, and most manual and digital fabrication tools are available in our Digital Design Fabrication Studio on LL2 in HEB adjoining MVR. To quickly create working, interactive prototypes, you are strongly encouraged to use littleBits (http://littlebits.cc/), a kit of electronic parts that snap together magnetically. A TED Talk for LittleBits can be found at http://littlebits.cc/education or directly from https://www.youtube.com/watch?v=YguB-keZ4Tk. These three videos present case studies of interaction designers using littleBits for prototyping:
• Incredible Machines, a Brooklyn-based collective of designers, technologists and makers. http://littlebits.cc/incredible-machines-case-study
• Havas— “Interactive installations in minutes” http://littlebits.cc/havas-case-study
• “Startups Use littleBits to Prototype and Pitch Their Ideas” http://littlebits.cc/startups-use-littlebits-to-prototype-and-pitch-their-ideas
V. Assessment of Student Performance and Grading Policies:
Throughout this course—an intimate and intensive “conversation” across students, professor, and TA—students will have ample opportunity to receive feedback on their work. In addition, students within teams will grade each other, student teams will grade other student teams, and student grading will be considered in assigning grades for this course. Students will receive a grade in response to work, weighted as follows:

• (10 points) **Attendance and participation in class discussions, reviews, and activities.** This is based on occasional, unannounced attendance calls at the start of class, and by the quality of your input when your name is blindly selected from my “magic box,” a box holding the names of all enrolled students in this course.

• (10 points) **Completion of Cornell IRB’s CITI training for new human participant researchers.** Email Cornell’s completion certificate to the TA before Thanksgiving break. Failure to complete or late notice results in 0% grade for this component of the course.

• (20 points) **2 quizzes** (True/False and multiple choice). Each quiz is worth 10 points of the total grade, testing basic content of assigned readings. (Download publisher’s powerpoint slides if you wish; I do not provide my slides).

• (20 points) **Mid-term deliverables, also presented in class.** For each team, on one thumb drive: one manifestation of each of the 9 ideation strategies, a persona, a scenario, a "money shot" (best image) of your prototype, and a "demo" of your design captured by video. Four students will work together as a team and receive the same grade.

• (40 points) **Final Course Deliverable, also presented in class.** For each team, on one thumb drive and printed: one manifestation of each of the 9 ideation strategies, a paper, poster, design diary, and video, including their documentation. Four students will work together as a team; however, each member of the team will be chiefly responsible for one of the four key deliverables, and will be graded for this component. (Students will make this assignment clear to the instructor for the purpose of grading.)

More about the four deliverables for this course:
(1) **a written, printed paper** communicating the iterative, human-centered design process for an interactive artifact developed in-groups of three;
(2) **a printed poster** communicating the basic content of the same paper;
(3) **a printed design diary** containing [a] weekly photographs of your team’s developing prototype, with a written description of what was learned from the research study (or studies) performed that week that informed its development (this is a one page document); [b] the final prototype carefully photographed (including a “the money shot” and a photo of the prototype in which all components of the prototype are labeled, and
(4) **a video** communicating the full, cohesive story of the designed artifact your team produced, answering why, for whom, and how it was developed, including an overview of the methods used to design and evaluate it. The animated GIF assigned early in the term is part of this video deliverable.

This paper, poster, and video will follow, precisely, the directions ([https://chi2017.acm.org/lbw.html](https://chi2017.acm.org/lbw.html)) for a “Late Breaking Work” (LBW) submission to CHI, the ACM Conference on Human Factors in Computing Systems. Students in teams of three will create the paper, the poster, and the design diary; however, one student of the team will take credit for the paper; another team member, for the poster; and the
third team member, the design diary. (Students will make this assignment clear to the instructor for the purpose of grading.) The grading is on a 60-point scale follows a grading rubric (provided on the course webpage). The professors “notes” (provided on the course webpage) will also prove helpful in preparing your paper and poster. You are encouraged to learn from prior LBW (and WiP) efforts linked to the course webpage and found in the thousands in the ACM DL.

To further guide the development of your paper, you are required to come to class having entered, into the “Extended Abstracts” paper format, your discussion and results (including any associated figures and tables) for that content/studies you accomplished in the previous week. At (often unannounced) class sessions, name(s) of one of more students will be blindly selected from the magic box to present this segment of the paper for class critique. These presentations will contribute to the selected students’ participation grade, and will help all members of the class to construct a better paper. As indicated in the weekly class schedule, all posters will be presented as drafts in class for critique.

The deadline for the printed paper, printed poster, printed design diary, and video, along with a thumb drive with your digital files for all these documents is the final class session. Digital files must include, for each team: (a) the paper in Word, (b) the poster, (c) the design diary, (d) the video URL or video file, and (e) supporting data-gathering documents, e.g. your survey, your interview questions,....

VI. Classroom Policies, including Attendance, Late Work, and Grading Issues

- Switch off your mobile phone.
- Arrive on time, engage, and participate.
- Ask if there is something you don’t understand.
- Offer an insightful remark (when you find a natural break in our class activity).
- Cite the work of others (https://plagiarism.arts.cornell.edu/tutorial/index.cfm).
- Check your email address and the online course page for timely information about this course.

Attendance and participation are mandatory and count for 10% of the grade. For each absence, email the professor with an explanation for the absence, attaching supporting documentation (e.g. doctor’s note) if any. It is your education, so you should take responsibility for yourself in attending all class sessions.

Late submissions will NOT be accepted, except with a doctor’s certificate or other proof of personal crisis or hardship. Failure to submit the printed documents and digital files with contents (a)-(e) will reduce your mid-term or final assignment grade 10 points.

Grading for this course is carefully determined by the professor and TA with thoughtful consideration of student grading of their peers. If you believe the grade for any component of this class including the final grade is incorrect, you may submit a written argument along with the component in question for reassessment. The written argument must reference a specific issue with the graded component of the course and must be thoroughly substantiated. The professor and TA will together consider the request, potentially with the assistance of other faculty with expertise in the area. The reassessment will result in any of the following outcomes: no change of grade, a change of grade for the better, a change of grade for the worse. Be warned: reassessment cases are too frequently cases in which a component (e.g. the paper, poster, or design diary) falls well short of the high expectations for the course such that the grade is changed for the worse! You understand that the grade for work submitted for reassessment may result in a grade lower than originally assigned.
VII. Schedule

08.22 | Course Organization and Definitions
> READ: (in class) Mau, B. "An Incomplete Manifesto for Growth."
> IN CLASS: form teams of three

08.24 | The Design Research Process
> READ: Ch. 9&10 to p.360; A Design Cycle; B Problem Def.; D Requirements; G Mind Map
> IN CLASS: define the problem (including needs & requirements); generate a Mind Map

08.29 | Interfaces – defined, types, and cases; Literature Review
> READ: Ch. 6; C Lit Review; G Mind Map; Mitchell ; iishi-1; iishi-2
> IN CLASS: prepare a lit review together; iterate your Mind Map

08.31 | Ideation and Prototyping (part 1)
> READ: Ch. 11; E Collage; U Ix Prototyping; Dow, S. WoZ; review "Making Collage" on webpage
> IN CLASS: ideate with the strategies above;

09.05 | Ideation and Prototyping (part 2)
> READ: F Analogy & Metaphor; H Morphological Chart (more)
> IN CLASS: ideate with the strategies above

09.07 | IdeaTed and Prototyping (part 3)
> READ: I Scamper; J Storyboard (more)
> IN CLASS: ideate with the strategy above, reflect, and prepare a Storyboard

09.12 | Personas, Scenarios, Role Playing, and Task Analysis
> READ: Ch. 10, pp.370-384; K Scenario (more); L Role Playing
> IN CLASS: reflect, write a scenario, and play the roles

09.14 | Interaction Design in Practice (including IRB and Agile UX)
> READ: Ch. 12; review U Ix Prototyping; Dow, S. WoZ; view animated GIF videos
> IN CLASS: analyze, reflect, and iterate your prototype; develop an animated GIF

09.19 | Data Gathering: Data Gathering: Overview, Observation, Ethnography, Triangulation
> READ: Ch. 7; N Observations; Q Focus Groups; Perek, G. Observational "Experiments"
> IN CLASS: observe, analyze, reflect, and iterate your prototype

09.21 | Data Gathering: Interviews [Presentation of Midterm reqts: 0 pts]
> READ: O Interviews
> IN CLASS: interview; generate your money shot (ex.s 1, 2, 3 and 4)

09.26 | Data Gathering: Surveys [Presentation of Midterm reqts: 0 pts]
> READ: P Surveys; Online survey (example); Review survey examples on course web page.
> IN CLASS: survey, analyze, reflect, and iterate your prototype

09.28 | Cultural Probes
> READ: Ch. 10 p. 361-362; R Cultural Probes; Cultural Probes
> IN CLASS: develop and implement a cultural probe

10.03 | Cognitive and Emotive Interaction [QUIZ-1: 10 points]
> READ: Ch. 3&5; S Design for Emotion; T Emotion Measurement
> IN CLASS: measure emotion, analyze, reflect, and iterate

10.05 | Structuring Design Research Videos and Papers
> READ: V Video; Paper Template; review poster/paper/video examples online
> IN CLASS: assign team members to poster, paper, video, design diary; organize!

10.10 | [F A L L B R E A K K]
> READ: (something fun)
> IN CLASS: (none)

10.17 | [No lecture] Midterm Presentations

10.19 | Evaluations: Heuristic Evaluations, including Cognitive Walkthroughs
  > READ: Ch.s 13,14&15 p. 512-514
  > IN CLASS: perform Cognitive Walkthroughs, analyze, reflect, and iterate

10.24 | Evaluations: Usability Studies
  > READ: Ch.s 15 to p. 511, M Heuristic Eval. (Nielsen's Heuristics); SUS/PSSUQ
  > IN CLASS: perform an SUS Evaluation, analyze, reflect, and iterate

10.26 | Evaluations: Delphi Method and Quasi-Experiment Studies
  > READ: The Delphi Method
  > IN CLASS: perform a Delphi Method study, analyze, reflect, and iterate

10.31 | Evaluations: Analytics, Crowd Sourcing, Using Models
  > READ: Ch.s 15 p. 514-521
  > IN CLASS: perform a study with Amazon Mechanical Turk, analyze, and iterate

11.02 | Research through Design (RtD) / Review of CHI Paper Template
  > READ: Frayling, C. Research in Art and Design; Zimmerman, Forlizzi, & Evenson. RtD
  > IN CLASS: edit your paper following from RtD

11.07 | Workshop to Advance your Paper, Poster and Video [QUIZ-2: 10 points]

11.09 | Workshop to Advance your Paper, Poster and Video

11.14 | Workshop to Advance your Paper, Poster and Video [FULL DRAFT OF PAPER IS DUE]

11.16 | Workshop to Advance your Paper, Poster and Video

11.21 | Workshop to Advance your Paper, Poster and Video [IRB COMPLETION CERTIFICATE IS DUE]

11.23 | [THANKS GIVING]

11.28 | Class Presentations, Demonstrations, and Poster Exhibition

11.30 | Class Presentations, Demonstrations, and Poster Exhibition [FINAL WORK DUE: 40 points]

VIII. Consent
To prepare the required paper and poster (and optional video) for this course, enrolled students will conduct peer-to-peer participant studies using their peers, enrolled in the same course, as participants. These studies will use the methods considered in this course, including: interviews, observations, surveys, co-design activity, heuristic evaluations, and cognitive walkthroughs. As part of this design research activity, students conducting these studies may take written notes, photographs, and/or video as a means of documentation. This documentation may be reproduced in the papers and posters for submission to CHI or a like conference, and may be presented at the conference. Student-participants will not be identified by name in such submissions/presentations, and no aspect of these studies should cause discomfort or risk to participants; nevertheless, should any student in the class choose not to participate in any aspect of the study, or have questions about her/his participation, please make this known to the instructor prior to the start of such study. Additionally, for any work of the course submitted for publication, student authors will be identified as first authors of the submission, and the instructor and any TA will follow in the list of authors of such work in recognition of their efforts in cultivating this work. If these terms are not acceptable to you, please indicate so to the instructor. Non-participation will not impact your grade for this course in any way.

IX. You are encouraged to join ACM SIGCHI and DRN
Students enrolled in this course are encouraged to join email postings (aka listservs) for ACM SIGCHI ANNOUNCEMENTS and DESIGN RESEARCH NEWS (both of these for design opportunities) and also ACM SIGCHI JOBS (in design). Students are also encouraged to become a student member of SIGCHI which
brings you a 1-year subscription to interactions magazine [print] and discounts on ACM conferences. Directions for joining all of these is found in a document linked from the course webpage.

X. Statement on Academic Integrity and Honesty
Each student in this course is expected to abide by the Cornell University Code of Academic Integrity. Any work submitted by a student in this course for academic credit will be the student's own work, except in the cases of projects that are specifically structured as group endeavors. In compliance with the Cornell University policy and equal access laws, the faculty, teaching assistants, and teaching associates for this course are available to discuss appropriate academic accommodations that may be required for students with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances, so that arrangements can be made. Students are encouraged to register with Student Disability Services to verify their eligibility for appropriate accommodations.

Please note: this syllabus (v. OCT. 4, 2017) is subject to revision; revisions will be dated and distributed.