DES 5185: Human Factors in Design
Course Coordinates:
Meets: Tues 6:15-9:15pm, McNeal 395
Credits: 3
Prerequisites: Grad student/senior or instructor consent

Office Hours:
Wednesdays, 10-11:30am. During this time I can be found either in the studio, my office, or in the lab. Appointments can be made outside of office hours if you have a conflict: this is the best strategy. In urgent situations I can often be found in my office and/or lab, and am happy to answer questions if it is at all possible. However – I am not always available on-demand, particularly during busy points in the semester. Plan your work time to avoid trying to put out fires at the last minute when there is no instructor available for questions.

Course Description:
Catalog Description
Exploration of the theories and methods that influence the assessment of physical, cognitive, social, and psychological human factors and the analysis of user needs with application to designed products that interact with a human user or the human body.

This course is an introductory overview to the theories and concepts of Human Factors and their application through the methods of User-Centered Design. Typically the class is comprised of students from a wide variety of disciplines and backgrounds. Course material is explored through readings, lectures, discussions, class activities, and course projects.

Course Objectives:
Upon completion of this course, students should be able to:

- Understand methods of describing the physical body, including anthropometrics and ergonomics, with application to designed products.
- Understand methods of describing cognitive, social, and psychological human factors with application to designed products
- Analyze and assess the ergonomics and human factors of designed products.
- Apply human factors research and information to the design of interactive or worn products and systems

Learning Outcomes:
1. Students in this course will be able to identify, define, and solve problems of human needs and human factors in the design of interactive or worn products. Learning will be assessed through evaluation of existing products, and through the design of original products that consider human needs.
2. Students in this course will have mastered a body of knowledge and a mode of inquiry through readings and research. Knowledge will be applied through evaluation of existing products and through the design of original products. Learning will be assessed through evaluation of these design projects and through reading quizzes.

Texts:

Evaluation:
There are two projects and several class exercises in this course. In addition, there will be 4 reading quizzes distributed throughout the semester. Grading in the course is as follows:
Class exercises: 10%
Reading quizzes: 20%
Product analysis project: 25%
Product design project: 40%
Attendance/participation: 5%

The final grade is based on accumulated points divided by total points possible. Grades are determined as follows:
A 93.3%  B 83%  C 73%  D 63%
A- 90%  B- 80%  C- 70%  F below 60%
B+ 86%  C+ 76%  D+ 66%

Expectations
This course typically contains a very diverse student population. Our topic applies to practitioners in many disciplines, and the course enrollment reflects that variety. As such, there will be periods during the semester when we spend considerable time discussing topics that may not be central to your discipline and times when we focus on topics that may be very familiar to you. I encourage you to bring your expertise to our discussions of familiar topics, and to expect to feel less comfortable in new areas. Each area has implications (however remote) for all practices, and you may find it helpful to seek out the relevance in a new topic.

- Students are responsible for all class meetings and materials, including information in the syllabus and information disseminated in class.
- Students are responsible for being on time and prepared for all class sessions.
- Students are responsible for completing assigned readings within one week of the date they were assigned, or before the next class meeting, whichever is later.
- Students are responsible for meeting all course requirements, observing deadlines, exam times and other course procedures.
- Students are responsible for seeking help when needed.
- Students may not publically share with others or make commercial use of their notes or lectures or University provided materials without the written consent of the instructor.

**Students understand that enrollment in this course grants consent for their work to be selected for inclusion in college or departmental publications (online or in print). Your instructor may select to use your work to represent her/his skills as an instructor in a teaching portfolio (online or in print).**

Attendance
Attendance is strongly encouraged for all class sessions, and punctuality is essential. If you must miss a class session, you are responsible for arranging to make up any missed work and for all material and information covered in that class. You are encouraged to take advantage of the scheduled class time to seek my feedback and that of your peers, and to share your experiences so that others might benefit as well. You are expected to participate in class discussions and critiques, and be respectful and polite when critiquing classmates' work. Assigned work is due at the beginning of each class, and will otherwise be considered late. Late work will be accepted at the beginning of the next class period, with a penalty of one letter grade. No work will be accepted more than one class period late.

The following reasons justify absences and makeup requests and must be documented: (a) illness certified by the Boynton Health Service or another physician (b) death parent, sibling, or grandparent (proof of funeral attendance must be supplied), (c) participation in religious observances with advance instructor notification (d) participation, certified by the Office for Student Affairs (Office of the Registrar-St. Paul, 190 Coffey Hall), in University approved co-curricular activities.

Grading
A-F grades will be assigned in accordance with University definitions, plus or minus indicates performance relative to the letter grade definition.
A: achievement outstanding relative to the level necessary to meet course requirements (‘excellent’—above and beyond; initiative, creativity)
B: achievement significantly above the level necessary to meet course requirements (‘good’)
C: achievement that meets the basic course requirements in every respect (‘just fine’)
D: achievement worthy of credit even though it does not fully meet the basic course requirements in every respect
F: performance that fails to meet basic course requirements and is unworthy of credit

Incomplete
Incomplete will be given only in cases of your own documented medical or family emergency. At least 75% of coursework completed with a passing grade is required for an Incomplete.

Student Release of Work
Students understand that enrollment in this course grants consent for their work to be selected for inclusion in college or departmental publications (online or in print.)

Academic Dishonesty
You are expected to do your own academic work and cite sources as necessary. Failing to do so is scholastic dishonesty. Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis. (Student Conduct Code: http://www1.umn.edu/regs/policies/academic/student_conduct_code.html) If it is determined that a student has cheated, he or she may be given an “F” or an “N” for the course, and may face additional sanctions from the University. For additional information, please see: http://policy.umn.edu/Policies/Education/Education/INSTRUCTORRESP.html.
The Office for Student Conduct and Academic Integrity has compiled a useful list of Frequently Asked Questions pertaining to scholastic dishonesty: http://www1.umn.edu/oscai/integrity/student/index.html. If you have additional questions, please clarify with your instructor for the course.

Classroom Conduct
The University seeks an environment that promotes academic achievement and integrity, that is protective of free inquiry, and that serves the educational mission of the University. Similarly, the University seeks a community that is free from violence, threats, and intimidation; that is respectful of the rights, opportunities, and welfare of students, faculty, staff, and guests of the University; and that does not threaten the physical or mental health or safety of members of the University community.
As a student at the University you are expected adhere to Board of Regents Policy: Student Conduct Code. To review the Student Conduct Code, please see: http://www1.umn.edu/regs/policies/academic/student_conduct_code.html.

Note that the conduct code specifically addresses disruptive classroom conduct, which means "engaging in behavior that substantially or repeatedly interrupts either the instructor's ability to teach or student learning. The classroom extends to any setting where a student is engaged in work toward academic credit or satisfaction of program-based requirements or related activities."

Sexual Harassment
"Sexual harassment" means unwelcome sexual advances, requests for sexual favors, and/or other verbal or physical conduct of a sexual nature. Such conduct has the purpose or effect of unreasonably interfering with an individual's work or academic performance or creating an intimidating, hostile, or offensive working or academic environment in any University activity or program. Such behavior is not acceptable in the University setting. For additional information, please consult Board of Regents Policy: http://www1.umn.edu/regs/policies/humanresources/SexualHarassment.html

Equity, Diversity, Equal Opportunity, and Affirmative Action:
The University will provide equal access to and opportunity in its programs and facilities, without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression. For more information, please consult Board of Regents Policy: http://www1.umn.edu/regs/policies/administrative/equity_diversity_EQOA.html.

Disability Accommodations:
The University is committed to providing quality education to all students regardless of ability. Determining appropriate disability accommodations is a collaborative process. You as a student must register with Disability Services and provide documentation of your disability. The course instructor must provide information regarding a course's content, methods, and essential components. The combination of this information will be used by Disability Services to determine appropriate accommodations for a particular student in a particular course. For more information, please reference Disability Services: http://ds.umn.edu/Students/index.html.

Mental Health Services:
As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance and may reduce your ability to participate in daily activities. University of Minnesota services are available to assist you. You can learn more about the broad range of confidential mental health services available on campus via the Student Mental Health Website: http://www.mentalhealth.umn.edu.

Academic Freedom and Responsibility:
Academic freedom is a cornerstone of the University. Within the scope and content of the course as defined by the instructor, it includes the freedom to discuss relevant matters in the classroom. Along with this freedom comes responsibility. Students are encouraged to develop the capacity for critical judgment and to engage in a sustained and independent search for truth. Students are free to take reasoned exception to the views expressed in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled.
## Course calendar*

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Readings assigned/Assignments Due</th>
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<tbody>
<tr>
<td>9/6</td>
<td>Intro to Human Factors</td>
<td><em>Norman (DOET): chs 1 &amp; 2</em></td>
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<tr>
<td>9/13</td>
<td>Human bodies: anthropometrics, ergonomics, and work</td>
<td><em>Wickens ch. 10, 11, &amp; 12</em></td>
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<td>9/20</td>
<td>Sensory systems: visual</td>
<td><em>Wickens ch 4 &amp; ch 8</em></td>
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<td><em>Quiz 1</em></td>
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<td>9/27</td>
<td>Sensory systems: auditory, tactile, vestibular, olfactory</td>
<td><em>Wickens ch 5</em></td>
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<td><em>Saunders &amp; McCormick ch. 6 pp184-192</em> – <em>Moodle</em></td>
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<td><em>Van Erp (2002) – Moodle</em></td>
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<tr>
<td>10/4</td>
<td>Cognition 1</td>
<td><em>Wickens ch 6</em></td>
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<td>-Possible guest lecture TBA</td>
<td><em>Norman (DOET): ch 3</em></td>
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<td><em>Quiz 2</em></td>
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<tr>
<td>10/11</td>
<td>Cognition 2</td>
<td><em>Wickens ch 7</em></td>
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<td>-Field Trip: Usability Lab</td>
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<td>10/18</td>
<td>Product analysis project</td>
<td><em>Product analysis projects</em></td>
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<td>Cognition 3 - Systems in context</td>
<td><em>Quiz 3</em></td>
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<td>Product analysis: frameworks, research</td>
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<td>10/25</td>
<td><strong>Product analysis presentations</strong></td>
<td><em>Product analysis projects</em></td>
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<tr>
<td>11/1</td>
<td>Psychology and emotion</td>
<td><strong>Product analysis project due</strong></td>
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<td>-Guest lecture: Fred Beecher</td>
<td><em>Norman (ED): chs 1-4</em></td>
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<td>11/8</td>
<td>Identity and social elements</td>
<td><em>Norman (ED): ch 5</em></td>
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<td>Assign product design project</td>
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<td>11/15</td>
<td>Product design: research</td>
<td><em>Wickens ch 2 &amp; 3</em></td>
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<td><em>Quiz 4</em></td>
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<tr>
<td>11/22</td>
<td>Product design: synthesis and ideation</td>
<td><strong>Design research due</strong></td>
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<td>11/29</td>
<td>Product design: feedback and refinement</td>
<td><em>Norman (DOET): chs 4-7</em></td>
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<td><strong>Preliminary design due</strong></td>
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<td>12/6</td>
<td>Product design: development</td>
<td><strong>User feedback due</strong></td>
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<tr>
<td>12/13</td>
<td><strong>Design project presentations</strong></td>
<td><strong>Product design project due</strong></td>
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*Schedule is subject to change.