

PSYC 340: Introduction to Human Factors Psychology (3 credits)

Fall 2021

Instructor: Yi-Ching Lee, Ph.D.

Email: ylee65@gmu.edu (preferred contact) include Psy340 in the subject line when emailing me

Office: David King Hall 2060

Office hours: Wednesdays 9:00-10:30 AM or by appointment

Course Description

Human Factors is a specialization of psychology that studies how humans interact with systems and technology, and how those interactions may be made better (e.g., safe, efficient, easy to learn, intuitive, enjoyable, etc.). Human Factors psychologists/engineers conduct research and work at companies that produce technology, but they also work for media companies, medical device manufacturers, the transportation sector (automotive and rail), government organizations, etc. This course is designed to introduce you to some of these areas of Human Factors by presenting information on three 'core' course topics: (1) historical events in the development of Human Factors as a discipline and future directions, (2) the cognitive 'attributes' of humans, and (3) methods used for studying human-technology interactions and accident investigations.

Blackboard Login Instructions

Access to [MyMason](#) and GMU email are required to participate successfully in this course. Please make sure to update your computer and prepare yourself to begin using the online format BEFORE the first day of class. Check [the IT Support Center](#) website. Navigate to [the Student Support page](#) for help and information about Blackboard. In the menu bar to the left you will find all the tools you need to become familiar with for this course. Take time to learn each. Make sure you run a system check a few days before class. Become familiar with the attributes of Blackboard and online learning.

Course Structure and Reading Assignments

Before you decide to continue in this course, there are two aspects about the course you should consider. First, Human Factors is highly interdisciplinary in nature, and because of this, we will be reading from a variety of original sources (and not a textbook). This means that assigned readings will include experimental articles on psychology, book chapters, reports, and other original source material. Reading original material (which is typically free) keep costs down for students, and allows me to select reading assignments that are as interesting, relevant, and on the cutting-edge of science as possible but they can also be more challenging to read than a traditional textbook. If you don't like reading, my advice is that you consider dropping this course.

Second, this course will require your active participation. There will be activities completed both inside and outside of class. These activities provide experience learning about and applying human factors principles and research methodology to evaluate contemporary products and systems and to investigate accidents. Because of the active nature of the course, some students find that it feels different than some of their past courses. While the course isn't necessarily more difficult than other courses, it may require more of your time outside of class. If you don't have much time for external activities, my advice is that you consider dropping this course.

Course Learning Outcomes

By the end of this course you will be able to:

- Explain how Human Factors becomes a specific discipline
- Describe fundamental concepts related to human capabilities and limitations
- Apply concepts related to human capabilities and limitations and analyze contributing factors in case study
- Interpret the strengths and weaknesses of product design and research methods
- Integrate methods and concepts related to human capabilities and limitations while evaluating and redesigning an existing product
- Identify challenges in human's interaction with current and emerging technologies

Technology Requirements

Hardware: You will need access to a Windows or Macintosh computer with at least 2 GB of RAM and access to a fast and reliable broadband internet connection (e.g., cable, DSL). A larger screen is recommended for better visibility of course material. You will need speakers or headphones to hear recorded content and a headset with a microphone is recommended for the best experience. For the amount of Hard Disk Space required taking a distance education course, consider and allow for:

1. the storage amount needed to install any additional software and
2. space to store work that you will do for the course.

If you consider the purchase of a new computer, please go to [Patriot Tech](#) to see recommendations.

Software: Many courses use Blackboard as the learning management system. You will need a browser and operating system that are listed compatible or certified with the Blackboard version available on the [myMason Portal](#). See [supported browsers and operating systems](#). Log in to [myMason](#) to access your registered courses. Some courses may use other learning management systems. Check the syllabus or contact the instructor for details. Online courses typically use [Acrobat Reader](#), [Flash](#), [Java](#), and [Windows Media Player](#), [QuickTime](#) and/or [Real Media Player](#). Your computer should be capable of running current versions of those applications. Also, make sure your computer is protected from viruses by downloading the latest version of Symantec Endpoint Protection/Anti-Virus software for free [here](#).

Students owning Macs or Linux should be aware that some courses may use software that only runs on Windows. You can set up a Mac computer with Boot Camp or virtualization software so Windows will also run on it. Watch [this video](#) about using Windows on a Mac. Computers running Linux can also be configured with virtualization software or configured to dual boot with Windows.

Note: If you are using an employer-provided computer or corporate office for class attendance, please verify with your systems administrators that you will be able to install the necessary applications and that system or corporate firewalls do not block access to any sites or media types.

Course-specific Hardware/Software

Check the syllabus for your course or contact the instructor prior to the start of the course to find out about specific technical requirements for your class. Hardware or software required for your course or program may be available for purchase at [Patriot Computers](#) (the University's computer store that offers educational discounts and special deals).

Course Schedule

MODULES (Mon-Fri)	TOPICS/LECTURE SLIDES	VIDEOS/READINGS	CASE STUDY (start in week 3)	DUE on FRIDAYS and MONDAYS by 11:59 PM EST
Module 1 08/23-09/03	Week 1 Overview of the course History of HF	Videos: Introduction to Human Factors Regis Part 1 Regis Part 2	--	--
	Week 2 How/why to investigate HF accidents?	Never cry wolf National Transportation Safety Board's accident investigation procedure Occupational Safety and Health Administration's accident investigation procedure	--	<ul style="list-style-type: none"> • Module 1 Quiz due 09/03 • Module 1 Reflection Journal due 09/03
Module 2 09/06-09/24	Week 3 HF theories and principles 1	2018 Tesla accident report	Case Study 1: Mid-air collision	Weekly Discussion #1 <ul style="list-style-type: none"> • Part 1 due 09/10 • Part 2 due 09/13

MODULES (Mon-Fri)	TOPICS/LECTURE SLIDES	VIDEOS/READINGS	CASE STUDY (start in week 3)	DUE on FRIDAYS and MONDAYS by 11:59 PM EST
	Week 4 HF theories and principles 2	Minding the Mind II: Safety-Critical Psychology	Case Study 2: Three mile island	Weekly Discussion #2 <ul style="list-style-type: none"> • Part 1 due 09/17 • Part 2 due 09/20
	Week 5 HF theories and principles 3	Fitts's law demonstration	Case Study 3: Chernobyl	Weekly Discussion #3 <ul style="list-style-type: none"> • Part 1 due 09/24 • Part 2 due 09/27 • Module 2 Quiz due 09/24 • Module 2 Reflection Journal due 09/24
Module 3 09/27-10/08	Week 6 Product design 1	Ch. 11 Design methods	Case Study 4: Challenger	Weekly Discussion #4 <ul style="list-style-type: none"> • Part 1 due 10/01 • Part 2 due 10/04
	Week 7 Product design 2	Why Google Glass failed? Prototyping – paper vs interactive?	Case Study 5: Medical error	Weekly Discussion #5 <ul style="list-style-type: none"> • Part 1 due 10/08 • Part 2 due 10/11 • Module 3 Quiz due 10/08 • Module 3 Reflection Journal due 10/08
Module 4 10/11-10/22	Week 8 Research methods 1	Quantitative research methods	Case Study 6: Landing of flight 1549	Weekly Discussion #6 <ul style="list-style-type: none"> • Part 1 due 10/15 • Part 2 due 10/18
	Week 9 Research methods 2	Ch. 2 Data collection methods	Case Study 7: Distracted driving	Weekly Discussion #7 <ul style="list-style-type: none"> • Part 1 due 10/22 • Part 2 due 10/25 • Module 4 Quiz due 10/22 • Module 4 Reflection Journal due 10/22
10/25-10/29	Week 10	--	--	Redesign clinic 1 due 10/29

MODULES (Mon-Fri)	TOPICS/LECTURE SLIDES	VIDEOS/READINGS	CASE STUDY (start in week 3)	DUE on FRIDAYS and MONDAYS by 11:59 PM EST
Module 5 11/01-11/19	Week 11 HF in transportation and aerospace systems	People must retain control of autonomous vehicles	Case Study 8: Sinking of MV Sewol	Weekly Discussion #8 <ul style="list-style-type: none"> • Part 1 due 11/05 • Part 2 due 11/08
	Week 12 HF in health care systems and human- computer interaction	Set phasers on stun	Case Study 9: Derailment of train 188	Weekly Discussion #9 <ul style="list-style-type: none"> • Part 1 due 11/12 • Part 2 due 11/15
	Week 13 HF in “smart” systems and HF career opportunities	CELL PHONES: The Psychosocial Risks	Case Study 10: Self- driving car	Weekly Discussion #10 <ul style="list-style-type: none"> • Part 1 due 11/19 • Part 2 due 11/22 • Module 5 Quiz due 11/19 • Module 5 Reflection Journal due 11/19
11/22-11/26	Week 14 Thanksgiving recess	--	--	--
11/29-12/3	Week 15	--	--	Redesign clinic 2 due 12/03
12/06-12/10	Week 16	--	--	Redesign clinic 3 due 12/10

Assignments Description

1. Quiz (50 points). There is 1 quiz at the end of each module. You will take them on Blackboard. While the quizzes are open-book, open-note, you will still need to study the lecture slides and read the assigned reading materials (posted on Blackboard) first, as each quiz needs to be finished within an hour. Each quiz is worth 10 points.
2. Weekly discussions and responses (100 points). There will be 10 case studies. These are accidents that happened in the past and you will need to complete two parts of the assignment. Part 1: you will A) read the accidents, B) search for more details about the accidents by utilizing library resources and Internet searches, C) identify contributing factors to the accidents, and D) propose solutions that prevent these accidents from happening again. Each original post is worth 5 points. Part 2: you will A) read one classmate's original post, and B) extend and critique the thoughts expressed in the original post. Each reply is worth 5 points.

3. Redesign clinic (100 points total). You will follow a series of prompts and activities to complete clinic 1, 2, and 3. These will take place during the second half of the semester. These will be individual work and require Internet searches and the use of library resources. You will apply human factors methods in product design to improve existing products that may have usability problems.
4. Reflection journals (50 points). There is 1 reflection journal at the end of each module. You will be asked to share thoughts, surprises, and challenges that you experienced during each module. Each journal is worth 10 points.

Course Policies

NOTE: No extra credit will be given in this course. Points will be updated on Blackboard regularly.

Late Assignments: All assignments must be turned in by 11:59 PM EST on the due date given on the assignment sheet.

Instructor-Student Communication: I will respond to your emails within 48 hours. If I will be away from email for more than one day, I will post an announcement in the Blackboard course folder. Before sending an email, please check the following (available on your Blackboard course menu) unless the email is of a personal nature:

1. Syllabus
2. Ask Professor
3. On-demand Blackboard videos on how to use Blackboard features, and Technical Requirements.

Feel free to respond to other students in the Ask Professor forum if you know the answer.

Technology. You will need a reliable computer and internet access to view course materials in Blackboard.

Grading Scale

Your letter grade can be calculated by dividing the number of points you earn by the total number of points possible. Please do not approach me about bending the class rules to make personal exceptions about your grade: I take fair and equitable treatment of all students very seriously, and every student will be subject to the same grading standards. The chart below should be useful for determining your course standings near the end of the semester:

Point Source	Maximum Score	Determining Final Letter Grade	
Quiz	50 points	A+ 97-100%	>=291 points
Weekly discussion (accident investigation)	100 points	A 93-96%	279-290 points
Redesign clinic	100 points	A- 90-92%	270-278 points
Reflection journal	50 points	B+ 87-89%	261-269 points
	Total 300 points	B 83-86%	249-260 points

Point Source	Maximum Score	Determining Final Letter Grade	
		B- 80-82%	240-248 points
		C+ 77-79%	231-239 points
		C 73-76%	219-230 points
		C- 70-72%	210-218 points
		D+ 67-69%	201-209 points
		D 60-66%	180-200 points
		F <59%	<=179 points

University Policies and Resources

- a. Academic Honesty: You are expected to be familiar with and abide by the University's Honor Code. The Code can be found [here](#). It is your responsibility to see me if you have questions about these policies. George Mason University has an honor code that states the following:

To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of the George Mason University Community and with the desire for greater academic and personal achievement, we, the student members of the university community, have set for this Honor Code: Student Members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.
- b. Students must follow the university policy for [Responsible Use of Computing](#)
- c. Student services: The University provides range of services to help you succeed academically and you should make use of these if you think they could benefit you. I also invite you to speak to me (the earlier the better).
- d. Students are responsible for the content of university communications sent to their George Mason University email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account.
- e. [The George Mason University Counseling and Psychological Services \(CAPS\)](#) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance. Counseling Center: Student Union I, Room 364, 703-993-2380.
- f. Students with disabilities who seek accommodations in a course must be registered with the [George Mason University Office of Disability Services \(ODS\)](#) and inform their instructor, in writing, at the beginning of the semester. All academic accommodations must be arranged through that office. Please note that accommodations **MUST BE MADE BEFORE** assignments or exams are due. I cannot adjust your grade after the fact.
- g. Students must follow the university policy stating that all sound emitting devices shall be turned off during class unless otherwise authorized by the instructor.

- h. [The George Mason University Writing Center](#) staff provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing. University Writing Center: Robinson Hall Room A114, 703-993-1200. The writing center includes assistance for students for whom English is a second language.
- i. [Diversity](#): George Mason University promotes a living and learning environment for outstanding growth and productivity among its students, faculty and staff. Through its curriculum, programs, policies, procedures, services and resources, Mason strives to maintain a quality environment for work, study and personal growth.