

# IDC 6602 Usable Cybersecurity & Privacy

School of Modeling, Simulation and Training

## Instructor Information

- Instructor: Yao Li
- Office Location: HPA2 233
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## Course Information

- Term: 2023 Spring
- Course Number & Section: IDC 6602
- Course Name: Usable Cybersecurity & Privacy
- Credit Hours: 3
- Class Meeting Days: Monday
- Class Meeting Time: 3:00 - 5:50 PM
- Class Location:
- Course Modality: M

# Course Description

The course introduces usability problems in security and privacy methods, tools, and software and overviews prominent examples of both failures and successes in usable security and privacy. It also surveys state-of-the-art techniques and evaluation methodologies. Students will learn different methods for usability tests in security and privacy design. They will practice the usability tests through a term project, including actually recruiting participants, collecting data, evaluating the usability, presenting the test results in oral and written form.

# Course Materials and Resources

No required textbooks. Here are some recommendations if you want a textbook to use:

Kathy Baxter, Catherine Courage, and Kelly Caine (2015): *Understanding Your Users: A Practical Guide to User Research Methods*. 2nd enhanced edition. Morgan Kaufmann. ISBN 978-0-12-800232-2.

Carol M. Barnum (2010): *Usability Testing Essentials*. Morgan Kaufmann. ISBN 978-0123750921.

Jeffrey Rubin and Dana Chisnell (2008): *Handbook of Usability Testing: How to Plan, Design, and Conduct Effective Tests*. 2nd edition. John Wiley & Sons. ISBN 978-0470185483.

Joseph S. Dumas and Janice C. Redish (1999): *A Practical Guide To Usability Testing*. Norwood, N.J. Ablex Publishing Corp. Revised edition 1999, Intellect Ltd.: ISBN 1841500208

Elizabeth Goodman, Mike Kuniavsky, Andrea Moed (2012): *Observing the User Experience: A Practitioner's Guide to User Research*. 2nd edition. Morgan Kaufmann, 978-0123848697.

Joseph S. Dumas and Beth A. Loring (2008): *Moderating Usability Tests: Principles and Practices for Interacting*. Morgan Kaufmann, ISBN 978-0123739339

# Student Learning Outcomes

At the conclusion of this course, students should be able to:

- realize the importance of user-centered design and usability evaluation in security and privacy designs
- choose between different methods for user needs analysis and user interface evaluation
- carry out usability tests
- have familiarity with the major usable security and privacy designs
- have familiarity with some of outstanding research problems in the field of usable security and privacy

## Course Activities

### Lectures:

The lecture consists of introduction of usability methods in usable cybersecurity and privacy design. The usability methods will be introduced by the instructor.

### Topic Presentation:

The goal of the topic presentation is to introduce some of the outstanding usable security and privacy designs and research problems in the field. Each student will present one paper of one of the 9 topics in usable security and privacy design (see Usable S&P Topics for details). Each topic has 2 papers. The student will need to summarize the readings and present it to the class in 15-30 minutes. Then the instructor will lead a discussion on the topic presented. Students who are not the presenter will need to read the articles before the class and prepare at least one question which will be discussed in class.

### Term Project:

Students need to do a term project. The goal of the project is to practice the usability tests in usable security and privacy. Students have two choices to start the project: 1) they can pick an existing security or privacy design, examine its usability issues, perform usability

studies on it and improve the design; 2) they can create a new usable security or privacy design for a certain application. In either choice, they will need to complete three deliverables: project proposal, user needs analysis & prototype of design (re-design), and usability testing. For each deliverable, they will need to present them to the class for feedback and comments (see weekly content for details).

### Important Dates

First class:	Jan 9
Withdrawal deadline:	Mar 24
Martin Luther King Jr. Day:	Jan 16
Spring Break:	Mar 13-19

## Assessment and Grading Procedures

Assignment	Percentage of Grade
Three Project Deliverables	30%
Three Project Presentations	30%
Topic Presentations	30%

Attendance and Participation	10%
Total	100%

<b>Letter Grade</b>	<b>Points</b>
A	93 – 100 points
A-	90 – 92 points
B+	87 – 89 points
B	83 – 86 points
B-	80 – 82 points
C+	77 – 79 points
C	73 – 76 points
C-	70 – 72 points
D+	67 – 69 points
D	63 – 66 points

D-	60 – 62 points
F	59 and below

## Submission Policy

- All assignment submissions should be uploaded online using the Webcourses.
- Please take care of the quality of your submissions. Positively, you need to ask yourself if you would hand this production to a client, a manager, a graduate committee, a journal, or a conference. Negatively, the standard is: If I can't read it easily, you will lose points.
- If you submit one week late after the due date, you will get 50% of the points. For example, you submit your homework within the next 7 days after its due date and it is graded as 18 out of 20, but because it is submitted late, you will get 9, which is 50% of 18 points. This policy does NOT apply to COVID-19 emergency, hurricane closure and other acceptable reasons defined by UCF policy (see "Make-Up Assignments for Authorized University Events or Co-curricular Activities" below).

### Weekly Content (may be subject to change):

Week	Date	Lecture Topics	Presentation Topics
1	Jan 9	Course Overview	
2	Jan 16	No class (Martin Luther King Jr. Day)	

3	Jan 23	Overview of Usability, Security & Privacy	Topic 1
4	Jan 30		Project Presentation: Proposal
5	Feb 6	Interview	Topic 2
6	Feb 13	Survey	Topic 3
7	Feb 20	Focus group & Card sorting	Topic 4
8	Feb 27	Prototyping Participatory Design	Topic 5
9	Mar 6		Project Presentation: User Need and Prototype
10	Mar 13	No class (spring break)	

11	Mar 20	Usability experiments	Topic 6
12	Mar 27	Heuristic evaluation Cognitive walkthrough	Topic 7
13	Apr 3	Other usability evaluation approaches  —	Topic 8
14	Apr 10	User Study Ethics	Topic 9
15	Apr 17		Project Presentation: usability test
16	Apr 24		

Usable S&P Topics:

1. Phishing education

Rick Wash and Molly M. Cooper. 2018. [Who Provides Phishing Training? Facts, Stories, and People Like Me](#). *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. Association for Computing Machinery, New York, NY, USA, Paper 492, 1–12.

DOI:<https://doi.org/10.1145/3173574.3174066>





*Symposium (USENIX Security 16)* (pp. 757-772).

#### 4. Usable encryption

Abu-Salma, R., Sasse, M. A., Bonneau, J., Danilova, A., Naiakshina, A., & Smith, M. (2017, May). [Obstacles to the adoption of secure communication tools](https://discovery.ucl.ac.uk/id/eprint/1560502/1/ASBDNS17-IEEE-secure_messaging_obstacles.pdf) (https://discovery.ucl.ac.uk/id/eprint/1560502/1/ASBDNS17-IEEE-secure\_messaging\_obstacles.pdf). In *2017 IEEE Symposium on Security and Privacy (SP)* (pp. 137-153). IEEE.

Stransky, C., Wermke, D., Schrader, J., Huaman, N., Acar, Y., Fehlhaber, A. L., ... & Fahl, S. (2021). [On the Limited Impact of Visualizing Encryption: Perceptions of E2E Messaging Security](https://www.usenix.org/system/files/soups2021-stransky.pdf) (https://www.usenix.org/system/files/soups2021-stransky.pdf). In *Seventeenth Symposium on Usable Privacy and Security (SOUPS 2021)* (pp. 437-454).

#### 5. Usable privacy policy and notice

Solove, D. J. (2012). [Privacy Self-Management and the Consent Dilemma](https://scholarship.law.gwu.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=2093&context=faculty_publications) (https://scholarship.law.gwu.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=2093&context=faculty\_publications). *Harv. L. Rev.*, 126, 1880.

S.K. Cherivirala, F. Schaub, M.S. Andersen, S. Wilson, N. Sadeh, J.R. Reidenberg, [Visualization and Interactive Exploration of Data Practices in Privacy Policies](https://www.usenix.org/sites/default/files/soups16poster25-cherivirala.pdf) (https://www.usenix.org/sites/default/files/soups16poster25-cherivirala.pdf), SOUPS '16 Poster Session, Jun 2016

#### 6. Privacy and security nudges

Alessandro Acquisti, Idris Adjerid, Rebecca Balebako, Laura Brandimarte, Lorrie Faith Cranor, Saranga Komanduri, Pedro Giovanni Leon, Norman Sadeh, Florian Schaub, Manya Sleeper, Yang Wang, and Shomir Wilson. 2017. [Nudges for Privacy and Security: Understanding and Assisting Users' Choices Online](https://dl.acm.org/doi/pdf/10.1145/3054926) (https://dl.acm.org/doi/pdf/10.1145/3054926). *ACM Comput. Surv.* 50, 3, Article 44 (August 2017), 41 pages.

Almuhimedi, Hazim & Schaub, Florian & Sadeh, Norman & Adjerid, Idris & Acquisti, Alessandro & Gluck, Joshua & Cranor, Lorrie & Agarwal, Yuvraj. (2015). [Your Location has been Shared 5,398 Times! A Field Study on Mobile App Privacy Nudging](#)

[https://dl.acm.org/doi/pdf/10.1145/2702123.2702210?casa\\_token=2\\_CTv3jfDWEAAAAA:nmaGUIR0x\\_i1N-ft14-Vo4TMOTazSaUalBzOzRkyxGj0x8AVqbm7gIAB7XIRgocR1ia7iCLIPpA](https://dl.acm.org/doi/pdf/10.1145/2702123.2702210?casa_token=2_CTv3jfDWEAAAAA:nmaGUIR0x_i1N-ft14-Vo4TMOTazSaUalBzOzRkyxGj0x8AVqbm7gIAB7XIRgocR1ia7iCLIPpA) . 10.1145/2702123.2702210.

## 7. Predicting privacy choices & privacy profiling

Bin Liu, Mads Schaarup Andersen, Florian Schaub, Hazim Almuhammedi, Shikun Zhang, Norman Sadeh, Alessandro Acquisti, and Yuvraj Agarwal, [Follow My Recommendations: A Personalized Privacy Assistant for Mobile App](#) (<https://www.usenix.org/system/files/conference/soups2016/soups2016-paper-liu.pdf>) Permissions. In Proceedings of the 12th Symposium on Usable Privacy and Security (SOUPS '12).

Jialiu Lin, Bin Liu, Norman Sadeh, and Jason I. Hong. 2014. [Modeling users' mobile app privacy preferences: restoring usability in a sea of permission settings](#) (<https://www.usenix.org/system/files/conference/soups2014/soups14-paper-lin.pdf>) . In Proceedings of the Tenth USENIX Conference on Usable Privacy and Security (SOUPS '14). USENIX Association, USA, 199–212.

## 8. Dynamic audience management on social media

Sleeper, M., Balebako, R., Das, S., McConahy, A. L., Wiese, J., & Cranor, L. F. (2013). [The post that wasn't: exploring self-censorship on facebook](#) ([https://dl.acm.org/doi/pdf/10.1145/2441776.2441865?casa\\_token=TX91CIKx8ngAAAAA:YJP4sQK90DbJwwl9Tx7EUE5DCJQjIqXbGKju8iiX7IPLsdsGLD4xdMfZQ6DzkoRolloq1Q5d\\_k4](https://dl.acm.org/doi/pdf/10.1145/2441776.2441865?casa_token=TX91CIKx8ngAAAAA:YJP4sQK90DbJwwl9Tx7EUE5DCJQjIqXbGKju8iiX7IPLsdsGLD4xdMfZQ6DzkoRolloq1Q5d_k4)) . In *Proceedings of the 2013 conference on Computer supported cooperative work* (pp. 793-802).

Ernala, S. K., Yang, S. S., Wu, Y., Chen, R., Wells, K., & Das, S. (2021). [Exploring the Utility Versus Intrusiveness of Dynamic Audience Selection on Facebook](#) ([https://dl.acm.org/doi/pdf/10.1145/3476083?casa\\_token=3GdzXtHJhTcAAAAA:97mYe0cjMFuQPO7dDouVX0NuwnfXX4btzvMubl4RnQiy5l\\_SDuuVMxYO-qf4E2s\\_tYl1Wz2F7Sw](https://dl.acm.org/doi/pdf/10.1145/3476083?casa_token=3GdzXtHJhTcAAAAA:97mYe0cjMFuQPO7dDouVX0NuwnfXX4btzvMubl4RnQiy5l_SDuuVMxYO-qf4E2s_tYl1Wz2F7Sw)) . *Proceedings of the ACM on Human-Computer Interaction*, 5(CSCW2), 1-30.

## 9. Collaborative privacy management

Rashidi, Y., Ahmed, T., Patel, F., Fath, E., Kapadia, A., Nippert-Eng, C., & Su, N. M. (2018). ["You don't want to be the next meme": College Students' Workarounds to Manage Privacy in the Era of Pervasive Photography](#)

<https://www.usenix.org/system/files/conference/soups2018/soups2018-rashidi.pdf> . In *Fourteenth Symposium on Usable Privacy and Security (SOUPS 2018)* (pp. 143-157).

Li, Y., Vishwamitra, N., Knijnenburg, B. P., Hu, H., & Caine, K. (2017). [Effectiveness and users' experience of obfuscation as a privacy-enhancing technology for sharing photos](https://dl.acm.org/doi/pdf/10.1145/3134702) (<https://dl.acm.org/doi/pdf/10.1145/3134702>) . *Proceedings of the ACM on Human-Computer Interaction*, 1(CSCW), 1-24.

## UCF Policies

### Academic Integrity

Students should familiarize themselves with UCF's Rules of Conduct at <<https://scai.sdes.ucf.edu/student-rules-of-conduct/>>. According to Section 1, "Academic Misconduct," students are prohibited from engaging in:

1. Unauthorized assistance: Using or attempting to use unauthorized materials, information or study aids in any academic exercise unless specifically authorized by the instructor of record. The unauthorized possession of examination or course-related material also constitutes cheating.
2. Communication to another through written, visual, electronic, or oral means: The presentation of material which has not been studied or learned, but rather was obtained through someone else's efforts and used as part of an examination, course assignment, or project.
3. Commercial Use of Academic Material: Selling of course material to another person, student, and/or uploading course material to a third-party vendor without authorization or without the express written permission of the university and the instructor. Course materials include but are not limited to class notes, Instructor's PowerPoints, course syllabi, tests, quizzes, labs, instruction sheets, homework, study guides, handouts, etc.
4. Falsifying or misrepresenting the student's own academic work.
5. Plagiarism: Using or appropriating another's work without any indication of the source, thereby attempting to convey the impression that such work is the student's own.
6. Multiple Submissions: Submitting the same academic work for credit more than once without the express written permission of the instructor.
7. Helping another violate academic behavior standards.
8. Soliciting assistance with academic coursework and/or degree requirements.

## Responses to Academic Dishonesty, Plagiarism, or Cheating

Students should also familiarize themselves with the procedures for academic misconduct in UCF's student handbook, The Golden Rule <<https://goldenrule.sdes.ucf.edu/>>. UCF faculty members have a responsibility for students' education and the value of a UCF degree, and so seek to prevent unethical behavior and respond to academic misconduct when necessary. Penalties for violating rules, policies, and instructions within this course can range from a zero on the exercise to an "F" letter grade in the course. In addition, an Academic Misconduct report could be filed with the Office of Student Conduct, which could lead to disciplinary warning, disciplinary probation, or deferred suspension or separation from the University through suspension, dismissal, or expulsion with the addition of a "Z" designation on one's transcript.

Being found in violation of academic conduct standards could result in a student having to disclose such behavior on a graduate school application, being removed from a leadership position within a student organization, the recipient of scholarships, participation in University activities such as study abroad, internships, etc.

Let's avoid all of this by demonstrating values of honesty, trust, and integrity. No grade is worth compromising your integrity and moving your moral compass. Stay true to doing the right thing: take the zero, not a shortcut.

## **Course Accessibility Statement**

The University of Central Florida is committed to providing access and inclusion for all persons with disabilities. Students with disabilities who need access to course content due to course design limitations should contact the professor as soon as possible. Students should also connect with Student Accessibility Services (SAS) <<http://sas.sdes.ucf.edu/>> (Ferrell Commons 185, [sas@ucf.edu](mailto:sas@ucf.edu), phone 407-823-2371). For students connected with SAS, a Course Accessibility Letter may be created and sent to professors, which informs faculty of potential course access and accommodations that might be necessary and reasonable. Determining reasonable access and accommodations requires consideration of the course design, course learning objectives and the individual academic and course barriers experienced by the student. Further conversation with SAS, faculty and the student may be warranted to ensure an accessible course experience.

## **Campus Safety Statement**

Emergencies on campus are rare, but if one should arise during class, everyone needs to work together. Students should be aware of their surroundings and familiar with some basic safety and security concepts.

In case of an emergency, dial 911 for assistance.

Every UCF classroom contains an emergency procedure guide posted on a wall near the door. Students should make a note of the guide's physical location and review the online version at [http://emergency.ucf.edu/emergency\\_guide.html](http://emergency.ucf.edu/emergency_guide.html).

Students should know the evacuation routes from each of their classrooms and have a plan for finding safety in case of an emergency.

If there is a medical emergency during class, students may need to access a first-aid kit or AED (Automated External Defibrillator). To learn where those are located, see <https://ehs.ucf.edu/automated-external-defibrillator-aed-locations>.

To stay informed about emergency situations, students can sign up to receive UCF text alerts by going to <https://my.ucf.edu> and logging in. Click on "Student Self Service" located on the left side of the screen in the toolbar, scroll down to the blue "Personal Information" heading on the Student Center screen, click on "UCF Alert", fill out the information, including e-mail address, cell phone number, and cell phone provider, click "Apply" to save the changes, and then click "OK."

Students with special needs related to emergency situations should speak with their instructors outside of class.

To learn about how to manage an active-shooter situation on campus or elsewhere, consider viewing this video (<https://youtu.be/NIKYajEx4pk>).

### **Campus Safety Statement for Students in Online-Only Courses**

Though most emergency situations are primarily relevant to courses that meet in person, such incidents can also impact online students, either when they are on or near campus to participate in other courses or activities or when their course work is affected by off-campus emergencies. The following policies apply to courses in online modalities.

To stay informed about emergency situations, students can sign up to receive UCF text alerts by going to <https://my.ucf.edu> and logging in. Click on "Student Self Service" located on the left side of the screen in the toolbar, scroll down to the blue "Personal Information" heading on the Student Center screen, click on "UCF Alert", fill out the information, including e-mail address, cell phone number, and cell phone provider, click "Apply" to save the changes, and then click "OK."

Students with special needs related to emergency situations should speak with their instructors outside of class.

### **Deployed Active Duty Military Students**

Students who are deployed active duty military and/or National Guard personnel and require accommodation should contact their instructors as soon as possible after the semester begins and/or after they receive notification of deployment to make related arrangements.

### **Make-Up Assignments for Authorized University Events or Co-curricular Activities**

Students who represent the university in an authorized event or activity (for example, student-athletes) and who are unable to meet a course deadline due to a conflict with that event must provide the instructor with documentation in advance to arrange a make-up. No penalty will be applied. For more information, see the UCF policy at <<https://policies.ucf.edu/documents/4-401.pdf>>

### **Religious Observances**

Students must notify their instructor in advance if they intend to miss class for a religious observance. For more information, see the UCF policy at <<http://regulations.ucf.edu/chapter5/documents/5.020ReligiousObservancesFINALJan19.pdf>>.

### **Copyright**

This course may contain copyright protected materials such as audio or video clips, images, text materials, etc. These items are being used with regard to the Fair Use doctrine in order to enhance the learning environment. Please do not copy, duplicate, download or distribute these items. The use of these materials is strictly reserved for this online classroom environment and your use only. All copyright materials are credited to the copyright holder.

### **Webcourses**

Webcourses is an online course management system (accessed through my.ucf.edu and then the “Online Course Tools” tab) which will be used as a medium for turning in assignments and a forum for communicating with your teammates. Under the “Discussion” section, you will have a designated forum section. My recommendation is to check Webcourses every 2-3 days for updates from your teammates or myself.

### **Unauthorized Use of Websites and Internet Resources**

There are many websites claiming to offer study aids to students, but in using such websites, students could find themselves in violation of academic conduct guidelines. These websites include (but are not limited to) Quizlet, Course Hero, Chegg Study, and Clutch Prep. UCF does not endorse the use of these products in an unethical manner, which could lead to a violation of our University’s Rules of Conduct. They encourage students to upload course materials, such as test questions, individual assignments, and examples of graded material.

Such materials are the intellectual property of instructors, the university, or publishers and may not be distributed without prior authorization. Students who engage in such activity could be found in violation of academic conduct standards and could face course and/or University penalties. Please let me know if you are uncertain about the use of a website so I can determine its legitimacy.

### **Unauthorized Use of Technology for Graded Work**

If you were in a classroom setting taking a quiz, would you ask the student sitting next to you for an answer to a quiz or test question? The answer should be no. This also applies to graded homework, quizzes, tests, etc.

Students are not allowed to use GroupMe, WhatsApp, or any other form of technology to exchange course material associated with a graded assignment, quiz, test, etc. when opened on Webcourses.

The completion of graded work in an online course should be considered a formal process: Just because you are not in a formal classroom setting being proctored while taking a quiz or test does not mean that the completion of graded work in an online course should not be treated with integrity.

The following is not all inclusive of what is considered academic misconduct. These examples show how the use of technology can be considered academic misconduct and could result in the same penalties as cheating in a face-to-face class:

Taking a screen shot of an online quiz or test question, posting it to GroupMe or WhatsApp, and asking for assistance is considered academic misconduct.

Answering an online quiz or test question posted to GroupMe or WhatsApp is considered academic misconduct. Giving advice, assistance, or suggestions on how to complete a question associated with an online assignment, quiz, or test is considered academic misconduct.

The use of outside assistance from another student or by searching the internet, Googling for answers, use of websites such as Quizlet, Course Hero, Chegg Study, etc. is considered academic misconduct.

Gathering to take an online quiz or test with others and sharing answers in the process is considered academic misconduct.

If a student or group of students are found to be exchanging material associated with a graded assignment, quiz, or test through any form of technology (GroupMe, WhatsApp, etc.), or use outside assistance (Googling answers, use of websites such as Quizlet, Course Hero, Chegg Study, etc.), they could receive anywhere from a zero grade on the exercise to an "F" in the course depending on the act.

### **Unauthorized Distribution of Class Notes**



Third parties may attempt to connect with you to sell your notes and other course information from this class. Distributing course materials to a third party without my authorization is a violation of our University's Rules of Conduct. Please be aware that such class materials that may have already been given to such third parties may contain errors, which could affect your performance or grade. Recommendations for success in this course include coming to class on a routine basis, visiting me during my office hours, connecting with the Teaching Assistant (TA), and making use of the Student Academic Resource Center (SARC), the University Writing Center (UWC), the Math Lab, etc. If a third party should contact you regarding such an offer, I would appreciate your bringing this to my attention. We all play a part in creating a course climate of integrity