1. **Course Number and Course Title:**

   COE 494-14 – Human-Centered Security and Privacy

2. **Credit Hours:**

   3 – 0 – 3

3. **Prerequisites and/or Co-Requisites:**

   Prerequisites: CMP 305 Data Structures and Algorithms
   Co-requisites: None.

4. **Name and Contact Information of Instructor:**

   Name: Dr. Reham Aburas
   Email: raburas@aus.edu
   Office: ESB 2070
   Phone: 06 515 4890
   Office Hours: Posted on office door and iLearn; also by appointment

5. **Course Description (Catalog Description):**

   Presents concepts of human-centered design for systems security and information privacy. Covers fundamental design frameworks and quantitative and qualitative methods for evaluating user studies within the security and privacy domain. Examines data protection methods, focusing on authentication, usable encryption, social engineering, and security challenges of emerging technologies, with emphasis on their implications on human factors.

6. **Textbook and other Supplemental Material:**

   Textbook:
   - S. Fischer-Hübner, and F. Karegar. *The Curious Case of Usable Privacy: Challenges, Solutions, and Prospects.* Springer, 1st ed., 2024.

   Other supplemental material:
   - S. Garfinkel, and Lipford H. R., *Usable Security: History, Themes, and Challenges,* Morgan & Clay Pool Publishers, 1st ed., 2014.
   - Lazar J., Feng H. J., and Hochheiser H., *Research methods in human-computer interaction*, Morgan Kaufmann, 2nd ed., 2017.
   - Cranor L. F., and Garfinkel S., *Security and Usability: Designing Secure Systems that People Can Use,* O'Reilly Media Inc., 1st ed., 2005.

7. **Course Learning Outcomes:**

   Upon completion of the course, students will be able to:
   1. Describe the fundamental principles of human-centered design for security and privacy.
   2. Apply quantitative and qualitative methods for evaluating security and privacy user studies.
   3. Categorize authentication, encryption, and access control techniques that balance security with usability.
   4. Analyze current security issues such as social engineering, privacy, and anonymity.
   5. Evaluate current challenges in security and privacy associated with new technologies as IoT devices, AR/VR and AI.
   6. Solve real problems in usable security and privacy using human-centered designs and data security techniques.

8. Teaching and Learning Methodologies:

Methods include lectures, case studies, class discussions, and group work. Students learning is assessed via homework assignments, quizzes, team project and exams.

9. Course Topics and Schedule:

Topic/Activity	Weeks
Introduction to Usable Security and Privacy	Week #1
Usable Security Threat Modelling	Week #2
Fundamentals of Human-Centered Designs – Research Methods	Week #3
Quantitative Evaluation of Human-Centered Designs	Week #4
Qualitative Evaluation of Human-Centered Designs	Week #5
Authentication in Smart Devices	Week #6
Usable Encryption	Week #7
Permission Models and Access Control + Midterm exam	Week #8
Social Engineering and Deceptive Designs – Phishing	Week #9
Social Engineering and Deceptive Designs – Dark Patterns	Week #10
Privacy and Anonymity	Week #11
Usable Security for IoT Devices	Week #12
Emerging Topics – AR/VR Security and Privacy + AI for Security and Privacy	Week #13
Project Presentations	Week #14
Final Exam	Week #15

10. Schedule of Laboratory and other Non-Lecture Sessions:

This course has no labs.
The team project is conducted by teams of 3 students and is due at the end of the semester. Student teams are required to propose a project in which they will apply the knowledge and techniques acquired throughout the course to create a working demo. The project will involve collecting and processing data from online sources or smart devices. Students are expected to analyze a security and privacy problem from user perspective and propose practical defense solutions. They will submit a final report that outlines the techniques applied, explains the steps taken, and provides a thorough analysis of the results. Students will present the projects in the final week.

11. Out-of-Class Assignments with Due Dates:

Assignment	Due Date (tentative)
Homework 1: Fundamentals of human-centered designs	Week #4
Homework 2: Authentication and usable encryption	Week #7
Project proposal	Week #9
Homework 3: Social engineering and deceptive designs	Week #11
Homework 4: Privacy and anonymity tools	Week #13
Team project	Week #14

12. Student Evaluation:

Assessment	Weight	Due Date (tentative)
Homework	10%	Cf. Section 11

Project proposal	5%	Cf. Section 11
Quizzes	10%	Week #3, 6, 10, 13
Midterm Exam	20%	Week #8
Team project	20%	Cf. Section 11
Final Exam	35%	Week #16

13. Assessment Instruments:

Assessment	Course Learning Outcomes
Homework	O1-O4
Project proposal	O6
Quizzes	O1-O5
Midterm Exam	O1-O3
Team project	O6
Final Exam	O1-O5

14. Contribution of Course to Program Outcomes:

BSCS Program Outcomes	Emphasis in this course	Course Learning Outcomes
(1) Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.	◑	O1–O3
(2) Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.	●	O1–O5
(3) Communicate effectively in a variety of professional contexts.		
(4) Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.	◑	O6
(5) Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.		
(6) Apply computer science theory and software development fundamentals to produce computing-based solutions.	○	O2–O6

Emphasis: ● High; ◑ Medium; ○ Low; Blank – Nothing Specific Expected

BSCoE Program Outcomes	Emphasis in this course	Course Learning Outcomes
(1) Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	◑	O1, O6
(2) Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	●	O1-O5
(3) Communicate effectively with a range of audiences		

(4) Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	○	O6
(5) Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives		
(6) Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	◑	O2-O4, O6
(7) Acquire and apply new knowledge as needed, using appropriate learning strategies		

Emphasis: ● High; ◑ Medium; ○ Low; Blank – Nothing Specific Expected

15. Letter Grade Policy:

Total (T)	Letter Grade
$93 \leq T$	A
$90 \leq T < 93$	A-
$85 \leq T < 90$	B+
$80 \leq T < 85$	B
$75 \leq T < 80$	B-
$70 \leq T < 75$	C+
$65 \leq T < 70$	C
$60 \leq T < 65$	C-
$50 \leq T < 60$	D
$T < 50$	F

Honor Code: AUS academic integrity code will be strictly enforced. Cheating will not be tolerated. If caught cheating, you will get an "XF" in the course). No electronics (phones, smart watches, laptops, etc.) are allowed during exams or quizzes. In addition, unsanctioned use of any Generative Artificial Intelligence model (e.g., ChatGPT or similar) in attempting quizzes, labs, exams, or homework assignments will be considered a violation of the AUS academic integrity code.

Exam/ Quiz Info Quizzes can be unannounced.

All exams and quizzes are closed-books, closed-notes, no internet is allowed, unless stated otherwise. A student will normally receive a score of 0 for any missed exam or quiz. At the instructor's discretion, this rule may be relaxed, only:

- in the case of extreme emergencies (e.g. death in family or severe illness) and
- an acceptable and verifiable excuse is provided, and/or
- permission was obtained from the instructor before the date of the exam/quiz

If the student has a valid reason for missing an exam or quiz (as mentioned above), no make ups will be given during the semester. The instructor will add the percentage of the missed exam to next exam, if any, or the final exam. If it is a quiz, the average quiz grade will be assigned.

If a student misses an assignment, exam, or class and has a valid written excuse, it has to be submitted within a maximum of 4 days of the missed activity. After this period, no further adjustments will be made. Sick Leaves have to be stamped by the AUS Health Clinic before submitting them to the instructor.

Homework/ Team Project Info: Homework and team project submissions must be submitted by the deadline. Late submissions are penalized at the rate of 25%. No submissions will be accepted after 3 days of the deadline. The student may be exempted from these penalties under the same conditions that an exam may be made up.

Grading Policy: If a student disagrees with the grade of any course work, he/she has to contact the instructor within 4 calendar days of receiving the result. After this period, no revisions will be made.

Attendance/ Leave Policy

- Attendance is mandatory. The AUS attendance policy of 15% maximum absences allowed will be enforced. Upon breaching the 15% absence rule the student will be automatically dropped from the course with a grade of W (regardless of whether or not the absence is justified). Attendance will be taken using iLearn Attendance tool any time during the lecture.
- There is no difference between excused and unexcused absences. An absence is an absence.
- Absences are counted from the first day of the term, not from the first day the student enrolls.
- A late arrival will count as one-half of an absence.
- Students leaving the class before it has been dismissed will be penalized one-half absence.
- Students who show irresponsible behavior or weak attendance (missing between 10%-15% of classes), may not qualify for privileges that may be applied at the end of the semester.

Disruptive Activities All communication devices (e.g. mobile phones, etc.) must be turned off during class. Students causing disruption (e.g. making noise) during class will be asked to leave the classroom, thereby incurring one-half absence. Students causing disruption during an exam/quiz will be asked to leave and will not be given make up exam/quiz.

Generative AI tools: The use of generative AI tools, including ChatGPT and other similar tools, to complete or support the completion of any form of exams, assignments or project in this course is not allowed and would be considered academic misconduct, unless stated otherwise by the course instructor.