University of Maine
School of Computing and Information Science

Course Name: Information Privacy Engineering **Number:** COS435/535 **Semester:** Fall 2022
Classroom: Neville Hall 108 **Class Hours:** 8:00 AM – 9:15 PM **(**TT)

Instructor: Sepideh Ghanavati **Office:** Boardman Hall234 **Email:** sepideh.ghanavati@maine.edu
Instructor Office Hours: Tuesdays 12:30 – 1:30 PM or by appointments.

Catalogue Listing: Overview of the current privacy (and security) regulations across the world and the associated privacy (and security) challenges, methodologies, and algorithms for applications ranging from Cyber-Physical Systems, the Internet of Things, Android/iOS/web applications, social networking platforms, and machine learning models.

Reading Materials: A reading list is provided in another document. The instructor will include the required reading material from the list, at the end of each lecture slides. The reading materials will be divided into mandatory and optional readings.

Textbook: Information Privacy Engineering and Privacy by Design, By William Stallings, 2020

Course Prerequisites: COS420 or by permission.

Expected prior knowledge and skills in: The successful student should have introductory knowledge of software engineering including requirements, design, and testing, introductory knowledge of software security and proficiency in programming.

Course objectives:
This course covers the methods and tools needed to learn privacy concepts as well as to design and develop privacy-protecting applications.

Course Topics: Information privacy and multi-jurisdictional privacy compliance, privacy governance frameworks, privacy engineering lifecycle methodology, privacy by design, usable privacy, privacy and emerging technologies, anonymity techniques, differential privacy and private AI.

Learning objectives:
- Integrate privacy into the software engineering lifecycle phases.
- Understand users' needs, perform user studies and design effective privacy notices.
- Evaluate software designs based on privacy principles and privacy requirements.
- Develop privacy-preserving systems.

Activities and Evaluation:
Students' performance will be evaluated based on class participation/discussions, assignments, a project and three exams.

- **Lectures** – There will be 150 minutes of lectures every week, Tuesdays and Thursdays, in which students will learn about topics in privacy engineering.
- **Readings** – Students will be assigned weekly readings from the academic papers on different aspects of privacy.
- **(CP) – Class Participation, Discussions and Discord/Slack (15% + 5% (Extra)) –** Students will reflect on reading materials and discussions in class as well as on the discussion forum on Brightspace. Students will discuss different subjects related to the course based on the reading list or case analysis

in class. The participation of all students is required. In addition, students must assess and give feedback on other students' projects. Discussions are an **individual** assessment.

- **(A) – Assignments (30%) –** Students will submit 3 take-home assignments whereby students apply methods taught in class to sample problems. The assignments will be either **individual** or **group** efforts, depending on the nature of the assignment. The instructor will announce the type in class. **Graduate students will have one extra assignment to complete in this course. This extra assignment will be counted as extra credit for undergraduate students**.
- **(D) – Discussant Activity (10%) –** Each student will select one of the course topics and act as a discussant on the day that that the topic will be taught in class based on the syllabus. The discussant will review 2 – 4 papers related to the topic before the session and will open up the session by presenting some of the challenges identified in those papers to the class. This is an **individual** assessment. More details are given in another document on Brightspace.
- **(TP) – Term Project (45%) –** Students will work on a project on a topic from the list given by the instructor. The detail of the topics must be approved by the instructor by the deadline specified below. The aim of these projects is to delve into one of the emerging topics related to privacy from point of view of regulations, users or developers. The details of the project are given on Brightspace.
- **Attendance Policy** – Attendance is not directly mandatory in this course. The students are expected to watch the zoom sessions if they cannot attend the class and they must participate in discussions in class, or on COS435/535 Discord Server/Slack regularly to receive the class participation grades.
- **Note that, the total of possible grade in this class is 105% which includes 5% bonus mark.**

Grading Policy:

The grading scale for the final mark is as follows:

Letter Grades	Numerical Range
A	94 - 100
A-	90 - 93.99
B+	87 - 89.99
B	84 - 86.99
B-	80 - 83.99
C+	77 - 79.99
C	74 - 76.99
C-	70 - 73.99
D+	67 - 69.99
D	64 - 66.99
D-	60 - 63.99
F	0 - 59.99

This scale may be curved to raise student grades at the instructor's discretion.

- Submitted work is due when specified. **With the instructor's permission and only in special cases**, you may be able to submit 1-3 days late (with a penalty). For every 12 hours of late submission, 5% marks will be deducted. That is, if you are late by 3 full days, 30% mark will be deducted. After the 3rd full day, your assignment, project and reports will be marked as 0, **with no exception.**
- Every submission has to be done through Brightspace in a digital format. Submissions via email or in person will be marked as 0. If you encounter any problems with Brightspace, it is your own duty to inform the instructor **in a timely manner, before the due date**. Brightspace problems can't be used as an excuse for late submission.

Course Schedule: The table (below) provides the initial distribution of topics discussed over the weeks in the semester. **This schedule is tentative and subject to change during the semester at the instruction discretion**. All changes will be announced in class or on the course website (Brightspace). Students are responsible for making sure they are informed about announcements.

Week	Class (TT)	Activity	Material
1	08/30 09/01	L0 L1	Syllabus, Introduction and Academic Paper Writing Introduction to Information Privacy & Privacy Engineering
2	09/06 09/08	L2 L3	Introduction to Privacy Laws Conceptual Frameworks for Privacy **– Topic Selection (Due Date)**
3	09/13 09/15 09/18	L4 L5 -	Privacy and Regulatory Compliance – **Assignment 1 (Posted)** Privacy Engineering Lifecycle Methodology – Architecture **Project Deliverable 0 (Due Date)**
4	09/20 09/22	L6 L7	Privacy Engineering Lifecycle Methodology – Stage 1 and 2 Privacy Engineering Lifecycle Methodology – Stage 3 – 6
5	09/27 09/29 10/02	L8 L9 -	Introduction to Privacy by Design Introduction to Privacy by Design **Assignment 1 (Due Date)**
6	10/04 10/06 10/09	L10 L11 -	Usable Privacy – Notice & Choice and Challenges Guest Lecture – Facebook – Privacy Researcher – **Assignment 2 (Posted)** **Project Deliverable 1 (Due Date)**
7	10/11 10/13	- L12	Fall Break Usable Privacy – Design and Development of Privacy Policies
8	10/18 10/20 10/23	L13 L14 -	Usable Privacy – Usability Studies and IRB Usable Privacy – Overview of Applied Statistics **Assignment 2 (Due Date)**
9	10/25 10/27	L15 L16	Privacy and Social Network Internet Monitoring and Web Tracking
10	11/01 11/03 11/06	L17 L18 -	Anonymity and Identity – Onion Routing, etc. – **Assignment 3 (Posted)** Anonymity and Identity – Anonymization Techniques **Project Deliverable 2 (Due Date)**
11	11/08 11/10	L19 L20	Anonymity and Identity – Differential Privacy - Introduction Anonymity and Identity – Differential Privacy and AI
12	11/15 11/17 11/20	L21 L22 -	Privacy and Emerging Technologies – Mobile Apps (Android/iOS) Privacy and Emerging Technologies – IoT **Assignment 3 (Due Date)**
13	11/22 11/24	L23 -	Privacy and Emerging Technologies - Blockchain Thanksgiving Break
14	11/29 12/01 12/04	L24 L25 -	Privacy and Emerging Technologies – Cloud Computing Guest Lecture – Google – Privacy Researcher **Project Deliverable 3 (Due Date)**
15	12/06 12/08	P2 P3	Project's Presentations – Posters Project's Presentations – Posters

Academic Honesty Statement:
Academic honesty is very important. It is dishonest to cheat on exams, to copy term papers, to submit papers written by another person, to fake experimental results, or to copy or reword parts of books or articles into your own papers without appropriately citing the source. Students committing or aiding in any of these violations may be given failing grades for an assignment or for an entire course, at the discretion of the instructor. In addition to any academic action taken by an instructor, these violations are also subject to action under the University of Maine Student Conduct Code. The maximum possible sanction under the student conduct code is dismissal from the University. Please see the University of Maine System's Academic Integrity Policy listed in the Board Policy Manual as Policy 314: https://www.maine.edu/board-of-trustees/policy-manual/section-314/.

Students Accessibility Services Statement:
If you have a disability for which you may be requesting an accommodation, please contact Student Accessibility Services, 121 East Annex, 581.2319, as early as possible in the term. Students who have already been approved for accommodations by SAS and have a current accommodation letter should meet with me, Dr. Sepideh Ghanavati, privately as soon as possible.

Course Schedule Disclaimer (Disruption Clause):
In the event of an extended disruption of normal classroom activities (due to COVID-19 or other long-term disruptions), the format for this course may be modified to enable its completion within its programmed time frame. In that event, you will be provided an addendum to the syllabus that will supersede this version.

UMaine Student Code of Conduct:
All students are expected to conform to the UMaine Student Code of Conduct.

Classroom Civility:
Civility should be conveyed to all others through courteous expression, politeness, esteem and regard for others, and a general respect for others, regardless of differences from self.

Inclusive and Non-Sexist Language:
The University of Maine, as an equal opportunity educational institution, is committed to both academic freedom and the fair treatment of all individuals. It therefore discourages the use of sexist language. Language that reinforces sexism can arise from imprecise word choices that may be interpreted as biased, discriminatory, or demeaning even if they are not intended to be. Accordingly, all University communications, whether delivered orally or in writing, shall be free of sexist language.

This policy shall apply to all future University publications, whether produced through Public Affairs or elsewhere, that are intended for distribution to students, parents, faculty, staff, or other people interested in the University of Maine. University publications shall include, but not necessarily be limited to: University printing office publications; promotional materials distributed by all units of the University both academic and nonacademic; and policy booklets prepared for students and faculty. Inventory on hand of existing publications may be used until exhausted or a publication is revised.

Each member of the University community is urged to be sensitive to the impact of language and to make a personal commitment to eliminate sexist language. Supervisory personnel have a particular responsibility to discuss this policy with faculty and staff and to make available to them guidelines on nonsexist language. Guidelines of the American Psychological Association on the use of nonsexist language provide direction and are recommended because they are brief and list examples, but others may be used. Consult the Communications and Marketing Department or Women's Gender and Sexuality Studies Program for alternatives (https://umaine.edu/womensgenderandsexualitystudies/).

Observance of Religious Holidays/Events:
The University of Maine recognizes that when students are observing significant religious holidays, some may be unable to attend classes or labs, study, take tests, or work on other assignments. If they provide adequate notice (at least one week and longer if at all possible), these students are allowed to make up course requirements as long as this effort does not create an unreasonable burden upon the instructor, department or University. At the discretion of the instructor, such coursework could be due before or after the examination or assignment. No adverse or prejudicial effects shall result to a student's grade for the examination, study, or course requirement on the day of religious observance. The student shall not be marked absent from the class due to observing a significant religious holiday. In the case of an internship or clinical, students should refer to the applicable policy in place by the employer or site.

Sexual Discrimination Reporting:
The University of Maine is committed to making campus a safe place for students. Because of this commitment, if you tell a teacher about an experience of **sexual assault, sexual harassment, stalking, relationship abuse (dating violence and domestic violence), sexual misconduct or any form of gender discrimination** involving members of the campus, **your teacher is required to report** this information to the campus Office of Sexual Assault & Violence Prevention or the Office of Equal Opportunity.

If you want to talk in confidence to someone about an experience of sexual discrimination, please contact these resources:

For confidential resources on campus: **Counseling Center: 207-581-1392** or **Cutler Health Center: at 207-581-4000**.

For confidential resources off campus: **Rape Response Services:** 1-800-310-0000 or **Partners for Peace:** 1-800-863-9909.

Other resources: The resources listed below can offer support but may have to report the incident to others who can help:

For support services on campus: **Office of Sexual Assault & Violence Prevention: 207-581-1406, Office of Community Standards: 207-581-1409, University of Maine Police: 207-581-4040 or 911**. Or see the OSAVP website for a complete list of services at http://www.umaine.edu/osavp/

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2. Use of the instructor prepared web pages and the slides affiliated with each lecture on the syllabus may be assumed to be controlled by the University of Maine System Broad Application Copyleft License (proposed, current, or future) or through a similar license that may be posted at the bottom of each web page.
3. All class videos (lectures) should be assumed to be copyright protected in accordance with the University of Maine System Statement of Policy Governing Patents and Copyrights.

Contingency Plans in the Event of an Epidemic:
In the event of an influenza or similar epidemic that precludes the ability to meet in face-to-face sessions, assume that the instructor will either (1) host the course on our usual ConnectPro url for the class at the normal time and everyone will participate at a distance or (2) record a video of the lecture I would have otherwise presented in person and post it for viewing by downloading from the syllabus and/or from a web streaming video site (example: recorded on ConnectPro or recorded and then posted on the Spatial Information Science

and Engineering YouTube Channel). All other reading and module assignments should proceed as usual. If you yourself become sick, simply inform the instructor and the instructor will arrange appropriate extensions based on your particular circumstances.