# Texas Tech University
# Department of Computer Science

**Course Name:** Special Topics in Software Engineering **Number:** CS5332 **Semester:** Spring 2017
**Class Room:** ENGCTR 110 **Class Hours:** 9:30-10:50 (Tuesday/Thursday)

**Instructor:** Sepideh Ghanavati **Office:** EC306A **Email:** sepideh.ghanavati@ttu.edu
**Instructor Office Hours:** Tuesday 11:00AM – 12:00PM, Thursday 11:00 AM – 12:00 PM or by email

**TA:** TBA **TA-Office:** TBA **TA-Email:** TBA
**TA-Office Hours:** TBA

**Catalogue Listing:** Introduces theory and practice for software engineering, privacy and compliance. Topics include: Requirements Engineering, User Requirements Notation, Privacy and Multi-Jurisdictional Privacy Compliance, Usable Privacy, Privacy by Design, Anonymity, Data Privacy and Privacy in IoT.

**Reading Material:** A required reading list is provided at the end of the document.

**Course objectives:** This course covers the methods and tools needed to learn privacy concepts as well as to design systems for privacy with a specific focus on the requirements and design stages of the software development lifecycle.

**Learning objectives:**

- Learn the details of privacy concepts and challenges in privacy compliance
- Integrate privacy into the software engineering lifecycle phases
- Collect, analyze and reconcile system requirements in a privacy-sensitive ecosystem
- Evaluate software designs based on privacy principles and privacy requirements

**Activities and Evaluation:**
Students' performance will be evaluated based on class participation, assignments, group projects and a final exam.

- **Lectures** – There will be 3 hours of lectures every week, Tuesday and Thursday, in which students will learn about the privacy concepts and challenges and how to address some of these challenges with software and requirements engineering methodologies.
- **Readings** – Students will be assigned readings from the course textbook or academic papers to learn establish methods based on a strong engineering foundation. Additional readings will be selected and developed by the course instructor to include privacy theories that will be implemented using these methods.
- **Class Participation and Short Reports (10%)** – Students reflect on readings in class and contribute to in-class assignments/reports and discussions based on readings. This part is an individual assessment.
- **Assignments (30%)** – Students have 3-4 take-home assignments during the semester whereby students apply methods taught in class to sample problems. The assignments are individual assessments unless it is mentioned explicitly by the instructor. That is, there might be 1-2 assignments that can be done in a group of 2.
- **Project (40%) –** Students will work in a group of 2 students on a project from the topics given by the instructor. The detail of the topics and relevant papers must be approved by the instructor in the first month. The aim of these projects is to understand the privacy challenges and the potential solutions, analyze the current state of the art and identify new solutions to an existing problem, highlight privacy across different types of systems, e.g., personal vs. multi-stakeholder systems, or mobile vs. online systems, and across different domains, e.g., social networking, retail, health and travel. The students will give a presentation of the result of their project at the end of the semester in the time slot booked by them and must write a term paper on the topic. The paper must be original and discuss their own solutions, proposal or ideas.
- **Final Exam (20%)** – Students will do a final exam which includes all the topics taught and discussed in the class. More detail of the nature of the exam will be given during the review session. A student needs to pass the Final Exam in order to pass the course → Final Exam>= 60% which means 12 out of 20 of the total Final mark.
- **Attendance** – Students are allowed to have 4 free absences (excused or not). More than 4 absences will be penalized. The 5th missed will have 2 marks deduction of the overall final grade. After that, each absence is 1 mark deduction of the overall final grade. More details are given in the section, Class Attendance, below.

**Grading Policy:**

- The usual grading scale will be used for the final marks: A (90-100), B (80-89), C (70-79), D (60-69), F (0-59). This scale may be curved to raise student grades at the instructor's discretion. The detail of the scale is as followed:

| Letter Grades | Numerical Range |
|---|---|
| **A+** | 97 – 100 |
| **A** | 94 - 96.99 |
| **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 |

- Submitted work is due when specified. With the instructor's permission, 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 Blackboard in a digital format, either in Word or PDF. Submissions via email or in person (in paper format) will be marked as 0. If you encounter any problems with Blackboard, it is your own duty to inform the instructor **in a timely manner, before the due date**. Blackboard problems can't be used as an excuse for late submission.

**Academic Integrity:**

It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and high standard of integrity. The attempt of students to present as their own any work not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offenders liable to serious consequences, possibly suspension.

Academic dishonesty includes, but it not limited to, cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, and any act designed to give unfair academic advantage to the student (such as, but not limited to, submission of essentially the same written assignment for two courses without the prior permission of the instructor) or the attempt to commit such an act. Students are expected to know and understand the definitions of cheating, plagiarism, collusion, falsifying academic records and misrepresenting facts found in OP34.12. (http://www.depts.ttu.edu/opmanual/OP34.12.pdf).

Academic dishonesty of any kind, if discovered, will result in one or more of the following sanctions:

- a grade of 0 for the corresponding graded item,
- a grade of "F" in the course,
- and further action according to the TTU operating procedures found in OP34.12. (http://www.depts.ttu.edu/opmanual/OP34.12.pdf).

**Classroom Civility:**

All violations of classroom civility will be reported to the Student Judicial Programs. The Texas Tech University Catalog states: "Students are expected to assist in maintaining a classroom environment that is conducive to learning." In order to ensure that all students gain from time spent in class, **students are prohibited from engaging in any form of distraction**, e.g., reading newspapers (or other articles), working on other courses, and using cell-phones or laptops for calls or messages. If you indulge in any such inappropriate behavior (without explicit consent of the instructor), you will (at the very least) be asked to leave the classroom.

**Student with Disabilities:**
Any student who, because of a disability, may require special arrangements in order to meet course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor's office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office at 335 West Hall or 806-742-2405. Students requiring assistance should contact the instructor during the first week of class for pre-existing disabilities or as soon as the students receives verification from Student Disability Services. http://www.depts.ttu.edu/opmanual/OP34.22.pdf

**Center for Campus Life:**
The Center for Campus Life can assist in notifying the campus community of student illnesses, immediate family deaths and/or student death. Generally, in cases of student illness or immediate family deaths, the notification to the appropriate campus community members occur when a student is absent from class for four consecutive days with appropriate verification. It is the student's responsibility for missed class assignments and/or course work during their absence.

**Class Attendance:**
The student is responsible to inform the instructor, ahead of time if possible, of any absence and the reason. Make-up work due to absence(s) may be allowed on a case-by-case basis with a possible penalty only with instructor permission and with reference to TTU operating procedures. Make-up work should be submitted preferably before the next class period after the absence(s).

- Student Absence for Observance of Religious Holy Day, http://www.depts.ttu.edu/opmanual/OP34.19.pdf
- Sponsorship of Student Activities and Off-campus Trips, http://www.depts.ttu.edu/opmanual/OP34.06.pdf
- Class Attendance, http://www.depts.ttu.edu/opmanual/OP34.04.pdf

**Resolving Student Issues:**
Should a student encounter an issue in the course, the following chain of authority should be followed and not circumvented:

- Students should first discuss the issue with the instructor of the course in an attempt to resolve the issue;
- If the issue is not resolved, or the issue is of a matter that the student is not comfortable discussing with the instructor, the student should contact the Department Chair.
- Under no circumstances should the students start a resolution process with the Chair or Deans office without having discussions with the course instructor if possible.

Alternatively, The Ombuds for Students is available to assist students with any conflict or problem that has to do with being a student at Texas Tech University. You may visit the Ombuds in 024 East Basement Student Union Building or call 742.SAFE.

**TTU Resources for Discrimination, Harassment, and Sexual Violence:**
Texas Tech University is committed to providing and strengthening an educational, working, and living environment where students, faculty, staff, and visitors are free from gender and/or sex discrimination of any kind. Sexual assault, discrimination, harassment, and other Title IX violations are not tolerated by the University. Report any incidents to the Office for Student Rights & Resolution, (806)-742-SAFE (7233) or le a report online at titleix.ttu.edu/students. Faculty and staff members at TTU are committed to connecting you to resources on campus. Some of these available resources are: TTU Student Counseling Center, 806-742-3674, https://www.depts.ttu.edu/scc/ (Provides confidential support on campus.) TTU Student Counseling Center 24-hour Helpline, 806-742-5555, (Assists students who are experiencing a mental health or interpersonal violence crisis. If you call the helpline, you will speak with a mental health counselor.) Voice of Hope Lubbock Rape Crisis Center, 806-763-7273, voiceofhopelubbock.org (24-hour hotline that provides support for survivors of sexual violence.) The Risk, Intervention, Safety and Education (RISE) Office, 806-742-2110, rise.ttu.edu (Provides a range of resources and support options focused on prevention education and student wellness.) Texas Tech Police Department, 806-742-3931, http://www.depts.ttu.edu/ttpd/ (To report criminal activity that occurs on or near Texas Tech campus.)

**Emergency Procedures:**
In the unlikely event of an emergency, students and faculty should follow the guidance provided at the website below. There is a possibility that this may include evacuation of the building or seeking shelter within the building. http://www.depts.ttu.edu/hs/emergency_planning/index.php, http://www.depts.ttu.edu/communications/emergency/

**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 (Blackboard). Students are responsible for making sure they are informed about announcements.

| Week | Class (TR) | Activity | Material |
|---|---|---|---|
| 1 | 01/19 | L0 | Syllabus and Introduction |
| 2 | 01/24<br>01/26 | L1<br>L2 | Requirements Engineering Basics<br>Requirements Engineering Process |
| 3 | 01/31<br>02/02 | L3<br>L4 | RE Analysis and Specifications – Writing Better Requirements<br>User Requirements Notation (URN) and tools |
| 4 | 02/07<br>02/09 | L5<br>L6 | Goal-oriented Requirements Language (GRL)<br>Use Case Maps (UCM) |
| 5 | 02/14<br>02/16 | L7<br>L8 | Introduction to jUCMNav<br>Information Privacy: Concepts and Regulatory Landscape |
| 6 | 02/21<br>02/23 | L9<br>L10 | Privacy Compliance and Laws<br>Overview of Privacy Threat and Risk Models |
| 7 | 02/28<br>03/02 | L11<br>L12 | Multi-jurisdictional Privacy Compliance<br>LEGAL-URN Framework |
| 8 | 03/07<br>03/09 | L13<br>L14 | LEGAL-URN Framework |
| 9 | 03/14<br>03/16 | No class | Spring Break |
| 10 | 03/21<br>03/23 | L15<br>L16 | LEGAL-URN with jUCMNav<br>Privacy by Design |
| 11 | 03/28<br>03/30 | L17<br>L18 | Privacy by Design<br>Privacy Notice and Choice & Usability of Privacy Policies |
| 12 | 04/04<br>04/06 | L19<br>No Lecture/ TA will be present. | Anonymity and Identity<br>*PhD Defence Attendance*<br>Students will use this session to work on their projects. |
| 13 | 04/11<br>04/13 | L20<br>L21 | Data Privacy and Big Data<br>Privacy and Security for Mobile and IoT Devices |
| 14 | 04/18<br>04/20 | P1<br>P2 | Two presentations per session |
| 15 | 04/25<br>04/27 | P3<br>P4 | Two presentations per session |
| 16 | 05/02<br>05/04 | P5<br>No Lecture/ TA will be present. | Two presentations per session<br>*Requirements Engineering Conference – PC Meeting*<br>Students will work on their term papers. |
| 17 | 05/09<br>**05/11** | L22<br>**Final Exam** | Final Review<br>**Final Exam** |

**Reading Materials – This list will be updated during the semester.**

Textbooks:

- Axel van Lamsweerde (2009). Requirements Engineering: From System Goals to UML Models to Software Specifications, New Jersey: John Wiley & Sons, Inc.
- Ian K. Bray: An Introduction to Requirements Engineering, Addison Wesley, 2002

Reading Materials:

- B. A. Nuseibeh and S. M. Easterbrook, Requirements Engineering: A Roadmap. In A. C. W. Finkelstein (ed) The Future of Software Engineering, ACM Press, 2000 http://www.cs.toronto.edu/~sme/papers/2000/ICSE2000.pdf
- Amyot, D. and Mussbacher, G. (2011) User Requirements Notation: The First Ten Years, The Next Ten Years. Invited paper, *Journal of Software (JSW)*, Vol. 6, No. 5, Academy Publisher, May 2011, 747-768.
- Amyot, D., Ghanavati, S., Horkoff, J., Mussbacher, G., Peyton, L. and Yu, E. (2010) Evaluating Goal Models within the Goal-oriented Requirement Language. International Journal of Intelligent Systems (IJIS), Vol. 25, Issue 8, August 2010, 841-877.
- Michael Jackson, The World and the Machine; a Keynote Address at ICSE-17; Proceedings of ICSE-17; ACM Press, 1995.
- Pamela Zave and Michael Jackson, Four Dark Corners of Requirements Engineering; ACM Transactions on Software Engineering and Methodology, Volume 6 Number 1 pages 1-30, 1996.

Web Resources:

- jUCMNav - http://jucmnav.softwareengineering.ca/ucm/bin/view/ProjetSEG/WebHome