CSCI 412: Mobile Software Engineering

Fall 2023, 3 Credits
Department of Computer Science
North Dakota State University

Instructor

Ajay Jha, Assistant Professor
Web: https://hifromajay.github.io/
Email: ajay.jha.1@ndsu.edu
Office: QBB 258, B8
Office Hours: 11 am -12 pm, MWF. Also available by appointment. Send me an email to make an appointment.

Class

Time: 10:00:10:50 am, MWF
Room: 315 Walster Hall NDSU

Catalog Description

This course is designed to introduce the student to the best practices of mobile software engineering for developing high-quality, reliable, and secure mobile apps.

Course Objectives

People heavily rely on mobile apps to perform essential tasks such as banking. Therefore, mobile app quality, reliability, and security are important for users. This course covers the concepts, tools, and techniques necessary for developing high-quality, reliable, and secure mobile apps. This course mainly focuses on three different aspects of mobile software engineering: (1) opportunities, needs, and challenges, (2) quality and reliability, and (3) security. The first part covers why we need to learn mobile software engineering and what are the key challenges in developing high-quality, reliable, and secure mobile apps. The second part covers key quality and reliability issues in mobile apps including mobile app testing techniques. Finally, the third part covers common security vulnerabilities in mobile apps and how to avoid them. This course mainly focuses on the Android platform and Android apps.

Course Goals

After this course, students will have gained the following competencies:

- Understand various needs and challenges in developing high-quality, reliable, and secure mobile apps.
- Understand important quality and reliability issues in mobile apps including common types of bugs.
- Understand current practices of testing mobile apps and be able to use tools and techniques to write effective tests.
- Understand common security vulnerabilities in mobile apps and how to avoid them.

Course Schedule/Outline

Week	Topic	Projects/Assignments
1-2	Mobile Software Engineering: Opportunities, Needs, and Challenges	
3-4	Mobile App Development: Android Apps	Assignment 1
5-6	Mobile App Quality	Assignment 2
7-8	Mobile App Reliability	Assignment 3
9	Midterm Project Presentation	Midterm Project
10-12	Mobile App Testing	Assignment 4
13-15	Mobile App Security	Assignment 5
16	Final Project Presentation	Final Project

Approach

- Lectures will be delivered mainly using PowerPoint/Google slides, which will be available to students. The slides are detailed and will serve as course notes. Various other digital supplementary materials, such as literature and reports, will be available to students. Students are expected to study these materials to understand the subject and work on the course tasks. Students are encouraged to email or meet with any questions on the subject matter.
- The course tasks (assignments and projects) with their due dates will be posted on Blackboard. Students are encouraged to complete the tasks by the due dates, but no penalty would be imposed if the tasks are turned in late. However, no coursework will be accepted after the semester's due date. Also, the instructor will have the discretion to impose firm due dates with late penalties if deemed necessary.

- This course is designed to cover both theoretical and practical aspects of mobile software engineering. Therefore, students are expected to learn the concepts, tools, and techniques taught in the class and apply them to analyze or solve real-world problems through assignments and projects.

Textbooks and Readings

- There are no required or recommended textbooks for this course. The lecture slides will be the main resource for students. Students may need to read research articles as part of assignments and projects.

Course Tasks

- *Assignments:* Assignments will be posted on Blackboard and students will submit their completed work on Blackboard by the assigned due dates. For some assignments, students may also need to present the completed work in class.
- *Projects:* There will be two projects (midterm and final) in this course. The project submission links will be available on Blackboard. Students may also need to present the completed projects in class.

Evaluation and Grading

- *Evaluation criteria:* Assignments and projects will be evaluated based on the correctness and originality of the answer and fulfillment of the criteria mentioned in the assignments or projects.
- *Grading system:* The final grade will be calculated using the weighted grading system: attendance - 20%, assignments - 40%, and projects - 40%.
- *Grading scale:* **A** (90.0-100%), **B** (80-89.9%), **C** (70-79.9%), **D** (60-69.9%), and **F** (0-59.9%).

Professional Conduct

Academic dishonesty has very bad consequences. Copying ideas, sentences, tables, or figures without citation is plagiarism, a form of academic dishonesty. This is a very serious offense because you make it appear to be your work, but in fact, it is not. You must include citations and references when you copy. Receiving unacknowledged help is considered academic dishonesty. You must include citations and references in your work when you receive help, other than from faculty or course materials. For example, if you find a useful web page that was not specified in the assignment, then you must include a citation and reference for it. Similarly, if a discussion with someone is helpful, you should thank them by name in the Acknowledgments section, even if collaboration is not allowed on the assignment. Citations and references are optional for informal discussions. Giving unacknowledged help is also treated as academic dishonesty.

Attendance

According to NDSU Policy 333 (www.ndsu.edu/fileadmin/policy/333.pdf), attendance in classes is expected. When offered as a web-based (online) course, it is mandatory for enrolled students to fully access all posted online and textbook materials, study those materials, and complete all required assignments, discussions, quizzes, exams, and projects. In the case of a university-sponsored activity, required business trip, or medical procedure, a signed letter from your manager or doctor is required to allow for an extension of the due date. Please email me in advance of the expected absence to arrange any make-up or extensions. Veterans and student service members with special circumstances or who are activated are encouraged to notify the instructor as soon as possible and are encouraged to provide Activation Orders.

Americans with Disabilities Act for Students with Special Needs

Students with disabilities or other special needs requiring special accommodations in this course are invited to share these concerns or requests with the instructor and contact the Disability Services Office (www.ndsu.edu/disabilityservices).

Family Educational Rights and Privacy Act (FERPA)

Your personally identifiable information and educational records as they relate to this course are subject to FERPA (https://www.ndsu.edu/onestop/student-privacy-policy-ferpa).

Academic Honesty Statement

The academic community is operated based on honesty, integrity, and fair play. NDSU Policy 335: Code of Academic Responsibility and Conduct applies to cases in which cheating, plagiarism, or other academic misconducts have occurred in an instructional context. Students found guilty of academic misconduct are subject to penalties, up to and possibly including suspension and/or expulsion. Student academic misconduct records are maintained by the Office of Registration and Records. Informational resources about academic honesty for students and instructional staff members can be found at www.ndsu.edu/academichonesty.