# CSE 476: Mobile Application Development

## Spring Term 2019

**Course Information**

This course will introduce the unique requirements and methodologies necessary for developing dedicated and client-server applications that target smartphones, tablet computers, and other mobile devices. The course will address the unique memory, communications, and power requirements of these devices, as well as exploring new hardware capabilities such as location-aware computing and voice, image, and video communications.

We will use the Android operating system as the basis for this course. The general principles of mobile application development apply to all platforms and transitioning from Android to iOS or Windows 8 is relatively easy to do.

**Objective:**    Students completing this course are expected to be able to:

 ➢ Understand the unique aspects of mobile application design.
 ➢ Work in resource sensitive and resolution variant environments.
 ➢ Develop applications with location awareness and hardware sensors.
 ➢ Understand the use of a mobile device API.
 ➢ Develop applications in a client-server environment.

**Instructor:**    Dennis Phillips
Office:              3502 Engineering Building
Office Hours:    Email to schedule appointment.
dennisp@msu.edu

**TAs:**

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|---|---|
| Ibrahim Ahmed | ahmedibr@msu.edu |
| Ksenia Pestova | pestovak@msu.edu |
| Ziyi Huang | huangzi7@msu.edu |
| Office Hours: | TBD |

**Schedule:**    Mon/Wed 3:00pm to 4:20pm in 226 Erickson

**Textbooks:**    Introduction to Android Application Development: Android Essentials, 5th Edition (Covers Android 6)
By Joseph Annuzzi, Lauren Darcey, Shane Conder
Published Dec 18, 2015 by Addison-Wesley Professional.
ISBN-10: 0-13-438945-X
ISBN-13: 978-0-13-438945-5

**Special Materials:**    See the course home page for details on hardware and software requirements of the course.

During this course you will be commonly working with media data files and Android Studio projects, which can be very large and consume your quota. Consider utilizing flash drives for offloading what you don't need to keep on-line. Be sure to back up!

Bring a red pen to class for marking your toe-tippers.

**Prerequisites:**    CSE 320 or CSE 331 or CSE 335.

**WWW:**

Information about the class will be posted at:
http://www.cse.msu.edu/~cse476/

**Privacy:**

Electronic conversation via email, bulletin boards, or any of the d2l features, is different from verbal communication because it retains the identity of the participant. In this course, all participants will have access to a list of names and e-mail addresses of other course participants. Participants in the course will be able to send bulk e-mail to all other participants.

**Exams:**

This course will include a <u>practical examination</u>. The exam will be conducted in a computer laboratory. The exam is not currently scheduled but can be expected to occur in the last third of the semester.

Notice: This course will have one practical exam. The class will not have a written final exam. We will, however, meet the scheduled day of the final exam for evaluation of final projects. **Attendance will be required**. This date is Thursday, Dec 13 at 12:45pm.

**Toe-Tippers:**

Many class sessions will include a handout referred to as a "toe-tipper". This assignment will be completed during the lecture period. Some toe-tippers will be group assignments, others will be individual assignments. Notice: toe-tippers are to be done ONLY in class and, under normal conditions, <u>cannot be made up</u>! If you miss class, you miss it. The two lowest-score toe-tippers are discarded in the grading process. This is provided to allow for some missing of classes. If you must miss more than two classes for university excused absences, toe-tippers beyond the first two can be made up.

You must bring to class a pencil or black or blue inking pen AND a red inking pen. Many of the Toe-Tippers will be collaboratively executed and graded in class.

**Step Assignments:**

Many weeks there will be a tutorial/programming assignment that must be completed during that week. Some step assignments will include questions that must be answered as well as programming assignment steps. Step assignments are synchronized to the projects. So, not completing a step assignment will impact your ability to work as an effective project team member.

**Step Assignments Completion Rule:**

If you fail to turn in any project or step assignment, that assignment will be assigned a grade of negative 100%. If you turn in a step assignment but have not completed at least one of the step tasks you will receive 0 points for that step.

**Projects:**

3 projects will be assigned during the term. These assignments will be individually graded and some project work may be reflected in step assignment grades. The projects will be group projects. Each member is expected to contribute equally. All project code must reside in a GIT repository on https://git.cse.msu.edu Access must be provided to the repository for the instructor and all TAs. This access will be used to view the git logs to ensure that all team members are contributing to the project. If it is discovered that a team member is not contributing to a project, one warning will be issued. If there is no improvement the student will be informed, removed from the team, and receive 0 points for the project.

**Grading:**

Grade components are indicated on the grading page on the course web site and are as follows:

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|---|---|
| Exam: | 25% of total course points |
| Step Assignments: | 20% of total course points |
| Projects: | 40% of total course points |
| Toe Tippers: | 15% of total course points |

Final grades will be based on the scale:

| | |
|-----|-------|
| 4.0 | 90%+ |
| 3.5 | 85% |
| 3.0 | 80% |
| 2.5 | 75% |
| 2.0 | 70% |
| 1.5 | 65% |
| 1.0 | 60% |

Grades are rounded to the nearest integer, so an 89.5 is a 4.0.

**Attendance:** You are expected to attend all class sessions. Failure to attend a class will be reflected in your toe-tipper scores.

**Academic Honesty:** Article 2.3.3 of the Academic Freedom Report states that "The student shares with the faculty the responsibility for maintaining the integrity of scholarship, grades, and professional standards." In addition, the College of Engineering adheres to the policies on academic honesty as specified in General Student Regulations 1.0, Protection of Scholarship and Grades; the all-University Policy on Integrity of Scholarship and Grades; and Ordinance 17.00, Examinations. (See Spartan Life: Student Handbook and Resource Guide and/or the MSU Web site: www.msu.edu.) Therefore, unless authorized by your instructor, you are expected to complete all course assignments, including homework, lab work, quizzes, tests and exams, without assistance from any source. You are expected to develop original work for this course; therefore, you may not submit course work you completed for another course to satisfy the requirements for this course. Also, you are not authorized to use the http://www.allmsu.com, http://chegg.com, or similar web sites to complete any course work. Students who violate MSU rules may receive a penalty grade, including--but not limited to--a failing grade on the assignment or in the course. Contact your instructor if you are unsure about the appropriateness of your course work.

That's the university policy. My specific policies are as follows: You may discuss individual assignments with other students, but the assignment must be entirely your own work. Plagiarism just makes me mad! All work turned in must be your own. If you borrow or adapt software from a textbook or from source code that is obviously public, you must treat this as a quotation or paraphrase, acknowledging the source in the heading or the program module.

You may discuss assignments in general terms with your classmates, the course staff, or the instructor, but you are not permitted to receive solutions from others or to read or copy part or all of another person's solution to a problem.

I encourage you to visit honorcode.msu.edu to learn more about the Spartan Code of Honor academic pledge:

**"As a Spartan, I will strive to uphold values of the highest ethical standard. I will practice honesty in my work, foster honesty in my peers, and take pride in knowing that honor is worth more than grades. I will carry these values beyond my time as a student at Michigan State University, continuing the endeavor to build personal integrity in all that I do."**

**Disabilities**:    Students with disabilities should contact the Resource Center for Persons with Disabilities to establish reasonable accommodations. For an appointment with a disability specialist, call 353-9642 (voice), 355-1293 (TTY), or visit MyProfile.rcpd.msu.edu.

**Commercialization:**    Commercialization of lecture notes and university-provided course materials is not permitted in this course.

**Religious Holidays:**    You may make up course work missed to observe a major religious holiday only if you make arrangements in advance with the instructor.

**Required Activities**:    To make up course work missed to participate in a required activity for another course or a university-sanctioned event, you must provide the instructor with adequate advanced notice and a written authorization from the faculty member of the other course or from a university administrator.

**Attendance:**    Students whose names do not appear on the official class list for this course may not attend this class.

**Internet:**    Some professional journals will not consider a submission for publication if the article has appeared on the Internet. Please notify your instructor in writing if you do not want your course papers posted to the course Web site.

**Disruptive Behavior:**    Article 2.3.5 of the Academic Freedom Report (AFR) for students at Michigan State University states that "The student's behavior in the classroom shall be conducive to the teaching and learning process for all concerned." Article 2.3.10 of the AFR states that "The student has a right to scholarly relationships with faculty based on mutual trust and civility." General Student Regulation 5.02 states that "no student shall . . . interfere with the functions and services of the University (for example, but not limited to, classes . . .) such that the function or service is obstructed or disrupted. Students whose conduct adversely affects the learning environment in this classroom may be subject to disciplinary action through the Student Faculty Judiciary process.

**Course Content** (in a very approximate order of presentation)

- ➢ Mobile device application programming interfaces
- ➢ Resource-sensitive development
- ➢ Battery and power management
- ➢ Gestures and multi-touch interfaces
- ➢ Small device user interfaces
- ➢ Client-server application development
- ➢ GPS and location-aware computing
- ➢ Voice and audio communications
- ➢ Cameras, images, and video
- ➢ Hardware sensors
- ➢ Mobile telecommunication technologies

*Notice:* I never specify exactly what material will be covered on any particular week and reserve the right to modify the presentation order of materials. Likewise, I do not specify in advance the dates of projects and assignments. This is for your benefit. Course progress will be based on feedback from students, be it though grades or directly. Note, however, that we must cover the course materials, so if we slow in one area, we must accelerate elsewhere.

The course schedule is subject to change with appropriate notice. Dates for all assignments will be indicated on the class web site.