NORTHERN ARIZONA UNIVERSITY

School of Informatics, Computing, and Cyber Systems

CS 499 Course Syllabus

Course: CS 499: Advanced Mobile Application Development

Semester: Spring 2020

Section: 007 (10383)

Mode: In Person

Course Credit: 3

Pre-requisite: CS 249 with a grade of C or better

Mode of Instruction: Classroom Interaction

Classroom: SICSS, Room 102

Class Time: MWF, 9:10am – 10:00am

Instructor: Dariush Navabi, PhD.

Instructor's Contact Information:
Office Phone: (928) 523-3726
E-mail: via *BBLearn*, exclusively.

Instructor's Availability:
Office Location*:* EGR (Engineering Building, #69), Room #202B
Office Hours*:* 09:30am – 11:15am Monday & Wednesday
09:30am – 10:45am Tuesday & Thursday

Teaching Assistant: TBD
Office Location: TBD
Office Hours: TBD

Course Description: This course provides learning opportunities in programming for mobile device applications. Students will be familiarized with the special requirements for programming such devices and will gain knowledge of the considerations needed when designing and producing such applications. The Flutter application platform and Dart programming language are used to develop Android and iOS based mobile applications. Course lecture material will cover Dart programing language and Flutter platform, application of object orientated and functional programing concepts, distributed software architecture and software engineering concepts and practices. Flutter features including routes and navigation, stateless and stateful widgets, UI animation, and Firebase Cloud Firestore are covered. Course includes teamwork and collaboration. Students will form small development teams to develop a commercial grade software product. This brings together their knowledge of computer science and

software engineering and tools and techniques they learn in this course in a mobile software development project.

Course Coverage:

- Core Topics:
    - Listing of course topics is provided in the course plan.

- Tools:
    - Flutter Mobile Application platform
    - Dart Programming Language
    - Android Studio Development Environment
    - IntelliJ IDEA
    - Git-Hub source control
    - YAML

Course Student Learning Outcomes

Upon successful completion of this course, students will be able to demonstrate the following competencies:

- LO1: Select and apply design and programming methods; including generally-applicable high-level programming language control and data structures and data analysis techniques pertinent to mobile graphical user interfaces;
- LO2: Select and synthesize algorithms, data structures with features appropriate to the resource requirements of targeted mobile devices in the Android and iOS family of products;
- LO3: Apply and analyze designs from the first two learning outcomes using the Android development and test environment;
- LO4: Apply concepts and techniques regarding mobile systems theory and practice in the implementation of a commercial grade software application using computer science and software engineering concepts and practices; and
- LO5: Leverage and enhance project management and communications skills in a collaborative environment for development of a commercial grade mobile software application.

Assignments / Assessments of Course Student Learning Outcomes

Learning outcomes are assessed through a variety of means:

- A midterm and final exam assess student ability to describe and explain foundational concepts in mobile device GUIs (LO1), mobile device resources (LO2).
- Exams, individual and team homework assignments and quizzes assess student ability to synthesize and analyze mobile device concepts and methods (LO1, LO2, LO3, and LO4).
- In addition, team projects will assess student ability to take theory into practice in the mobile application domain environment (LO4).
- By collaborating on development of a significant software project in a small team and presentation of their work to the class students will practice and enhance their project management and communication skills (LO5).

References:

Students are not required to purchase a textbook for this course. Course reference material includes Flutter training videos Part-1 to Part-10 available on Linkedin LERANING website. You can login to this website here using you NAU credentials. Additional content will be provided as needed.

Online Presense: *BBLearn*

Midterm Exam: Wednesday, March 04, 2020

Final Exam: Monday, May 06, 2020: 7:30am-9:30am

Course Structure/Approach:

In this class, students are assigned self-study tasks to be done at home, while we reflect on what you have done at home in open discussions in class. Student are expected to come to class having completed the assigned self-study and expected to be engaged with learning activities during the class time. PowerPoint slides are used for both discussing the content and quizzing the students on their self-study tasks. Slides include questions that students need to answer in the class using iClicker. The questions generally are from the assigned self-study for the class, however, it may include material from previous classes.

Assessment and Grading

The grading scale is 90-100%=A, 80-89%=B, 70-79%=C, 60-69%=D, below 60%=F. Grade boundaries may be slightly shifted if needed. Component of grading is composed of:

Online Quiz:	10%
Homework Assignment:	10%
In class daily iCliker quiz:	20%
Group project:	30%
Midterm exam:	10%
Final exam:	20%

For more details on what is expected for each grade level, refer to the ASEE's Guidelines for Engineering Grading and Written Presentation Evaluation Rubric available on the course *BBLearn* page under the *General Course Information* folder.

Course Policies

- **Lectures and the Reference Material:** The lecture complements the training videos rather than being a mirror of it. If you only listen to the videos or only pay attention to the lecture, you're likely to end up missing some key concepts. To succeed in the class, listen to assigned videos before we discuss the corresponding topic in the lecture and then use the lecture as an opportunity to reconsider the key points of the material and ask questions on anything you're confused about.
- **Electronic devices:** We use iCliker for in-class quizzes. You must always have your iClicker with you. Feel free to bring your laptops and take electronic notes or try things out as we talk about them during lecture. During exams, no electronic device use is allowed; this includes music players with headphones. Also, please be courteous to your classmates by silencing your cell phones. The professor reserves the right to ask you to stop using any device if it is bothersome or distracting to the class.
- **Attendance:** Students are expected to attend and be on time for every class. There will be class interaction that will include recording graded classroom interaction almost every class day.
- **Group Project:** A project group ideally consist of 4 students. Project group of 3 students will be allowed only if necessary. The group project consists of 3 components as listed below:
    1. Proposal, initial design, work breakdown and assignment of work to team members.
    2. Project class presentation – 15 to 20 minutes presentation by the team. All members of the team must take part in the presentation.
    3. Final product – include final proposal, final design, work breakdown, assignment of work to team members, well structured and well documented implementation code, complete list of application use cases and complete test cases to show all use cases work as expected.
- **Late homework:** In general, you should do your best to turn in homework by due date. HomeWorks will not be accepted late and will earn 0 points. You have 1 opportunity (tokens) for up to a maximum

of 48 hours late submission. If you didn't already expend your token, a late submission that is within 48 hours of the due date will be automatically graded in exchange of the token.

- **Late quizzes:** Make-ups only when scheduled/approved in advance or with proper documentation (note from physician, etc.), as required by NAU policy.
- **Exams: There will be no make-up exams**. If you must miss an exam and discuss the reasoning with me prior to the exam, your final exam may be weighted to make up the missing points. A missed quiz/exam counts for a 0 for that part of the grade, if no prior excuse is provided.
- **Withdrawal deadline:** The deadline to drop with a "W" is (see NAU homepage). Students who wish to withdraw must complete all the relevant paperwork. Non-attendance of classes and/or non-completion of assigned work does not constitute a valid reason for withdrawal from the course and will result in a failing grade.
- **Students with disabilities:** Any student requiring special accommodations for exams (e.g., extra time, distraction reduced environment etc.) is responsible for discussing any accommodations being requested at least one week prior to each exam with the professor.
- **Grade review:** It is your responsibility to review all the grades you receive. If you have concerns about a grade, you must express those in writing within 5 business days of when the assignment was graded.
- **Dropped assignments:** The online quiz with the lowest score will be dropped when calculating final grades. No homework assignment will be dropped when calculating final grades. The three in class quizzes with the lowest grades are dropped when calculating final grade.
- **Academic integrity:** One of the foundations of academic life is honesty. Assignments and exams are ways to measure your understanding of the material being covered in the course. By cheating, you are cheating yourself out of the chance to have your understanding accurately evaluated. Grades are an indication of your final proficiency over the material, and not a form of punishment. Be honest and fair to your fellow classmates: do your own work. In the event of cheating, both the receiver(s) and the giver(s) will be treated the same way. Consulting with others and using their advice on homework is fine as long as you clearly identify the assistance you received when submitting the work. However, the work you submit should be your own work, and code that you thoroughly understand and for which you are entirely responsible. Consulting or communicating with others is strictly prohibited during quizzes and exams. Any form of academic dishonesty (such as "borrowing" text or materials) will be dealt with seriously. Consequences to incidents of academic dishonesty are based on the professor's discretionary recommendations and may include a zero grade in the assignment in question, an F in the course, or may be referred to the university's channels and result in expulsion from NAU. Just don't do it!
- **Course/Policy Modification.** The Instructor(s) reserve the right to add to, and/or modify any of the policies previously specified in this document as needed to maintain an appropriate and effective educational atmosphere in the classroom and the laboratory. In the case that this occurs, all students will be notified in advance of implementation of the new and/or modified policy.

University Policies

There are several university policies that govern your education and safety that all students should be aware of. These are:

- Safe Environment Policy
- Students With Disabilities
- Institutional Review Board (And Use Of Human Subjects)
- Academic Integrity
- Academic Contact Hour Policy
- Sensitive Course Materials

You will find a complete description of each policy here:
https://nau.edu/OCLDAA/_Forms/UCC/SyllabusPolicyStmts2-2014

University Support
There are a number of university services to help support students. These include:

- Emergency Textbook Loan – eligible students can apply for assistance with acquisition of textbooks for the semester.

- TRIO Outreach Programs - TRiO programs are a set of federally funded college opportunity programs that motivate and support students from disadvantaged backgrounds in their pursuit of a college degree.

- Educational Support Services - houses ten key offices that provide services to enhance the academic experiences of junior high, high school, college and returning adult students. We work to help students achieve their academic goals and achieve a bachelor's degree.

- Supplemental Instruction - attend these course-specific review sessions whenever offered; proven to reduce the chances of earning a D or F

- Student Learning Centers - free drop-in, online, and individual tutoring appointments for math, writing, and over 100 courses; available Monday through Friday

- ResourceConnect - your online central navigation point for all NAU student resources

- Action Center - messages to keep you academically on track. When you get a message take action!

- For a full-listing of University College services visit: http://nau.edu/university-college/forstudents--programs-resources-support/