Course Information

SER 423 Mobile Systems

Catalog Description

Mobile applications, their architecture, design, and supporting technologies; Mobile device operating systems and frameworks; synchronizing mobile applications, support for inter-application data-exchange; accessing and manipulating special-purpose device capability such as location, orientation, and input modality. Programming practices for securing and optimizing run-time performance of mobile applications.
Credit Hours : 3

Prerequisites by Topic, Course

• SER 421

Textbooks and Other Resources

• The iPhone Developer’s Cookbook: Building Applications with the iPhone SDK, by Erica Sadun; Pearson Education; ISBN 978-0321555458.

Course Description and Goals

This course is the fourth of the Distributed Web/Mobile focus area of BS Software Engineering. Students in the Web/Mobile focus area select one of: SER 422 covering Web applications or SER 423 covering mobile systems. Various frameworks and platforms may be used in the course such as: iOS/Cocoa, Android, and Windows Mobile. The course includes a team-based project that involves researching, and analyzing a mobile topic. It also include individual development of mobile apps on two separate platforms as well as design and realization of a mobile application that utilizes concepts of mobile user-interfaces, inter-application communication, on-platform storage, and mobile application synchronization. The course uses a project-based methodology.

Major Topics Covered

• Platforms: configurations, runtime environments and limitations.
• Mobile device language runtime environments; benchmarking their performance, and understanding their configuration.
• Development environments; tools and implementation characteristics.
• Development Paradigms and patterns for limited device applications; model, view, controller and others.
• User-interface; multi-touch interfaces and associated tool-kits; animation and multimedia; alerts.
• Facilities for communicating with other on-platform and off-platform applications.
• Facilities for storage of application data.
• Application life-cycle and context. Support for application-specific actions.
• Emerging technologies.

Course Coordinator
Timothy Lindquist

Sample Course Activities

1. Project
   Description
   Learning activities of the course include an incremental individual project, and a term-long team-based project. Projects explores aspects of mobile application development. Teams develop software artifacts and provide technical analysis and practice of course topics.

   Activity Type
   Team-based programming project.

   Grading Information
   The project activities account for 50% of the course grade, and are based on correctness of solution, proper use of distribution technologies, team-assessment, peer assessment, as well as software form and organization.

2. Exams
   Description
   Students complete an in-class midterm exam and a final exam covering the fundamentals of mobile computing.

   Activity Type
   In-Class Exams.

   Grading Information
   The exams account for 50% of the course grade.

Course Outcomes

1. CO1 Students are able to work in a team environment to develop, analyze, and document an evolving mobile technology.

   Student Outcomes Supported
   Communication, Teamwork
2. CO2 Students are able to: Develop applications that communicate and synchronize among mobile and non-mobile devices, such as game applications.

   Student Outcomes Supported
   Technical Competence

3. CO3 Students are able to: Select an appropriate mobile-device operating system and application configuration to meet the requirements of a mobile application, knowing the tradeoffs involved such as performance, security, and available framework support.

   Student Outcomes Supported
   Critical Thinking and Decision Making, Technical Competence

4. CO4 Students have knowledge of and experience in developing applications with extensive user-interfaces in the context of limited display and various device capabilities.

   Student Outcomes Supported
   Design, Technical Competence

5. CO5 Students have knowledge of programming practices that are specific to developing efficient applications for mobile devices, and knowledge of host and target development tools for popular mobile devices, including emulators and simulators, as well as device runtime environments.

   Student Outcomes Supported
   Software Engineering Practice