CMPS 393B-01 MOBILE CLIENT DEVELOPMENT
Fall 2023

Course Information
Course Number: CMPS 393B
Section: 1
Course Title: CMPS 393B Mobile Client Development
Credit Hours: 3

Lectures
Day and Time: TR - 5:00PM -6:20PM
Class Location: 205, Henry Thurman Hall

Course Catalog Description
Mobile Client Development. (Credit, 3 Hours). Introduce the concepts involved in Mobile Client Development, discussions around why mobile, what causes a business to go mobile, the components usually used in a mobile deployment, and the general usage patterns for a mobile application. (Two perspectives: Consumer based applications and enterprise-based applications).

Audience:
This course is designed for students in the under-graduate program in computer science.

Textbook and Materials:
1. Prescribed: Robert J. Bartz , Mobile Computing Deployment and Management, ISBN 978-1-118-82461-0-55999

Reference books:
1. Behrouz A. Forouzan, Data Communications and Networking 5th Edition, McGraw Hill; 5th edition (February 17, 2012), ISBN-13: 978-0073376226.
2. Gary J. Mullet, Introduction to Wireless Telecommunications Systems and Networks, Cengage Learning, ISBN 9788131505595 (ISBN10: 8131505596)

Course Instructor Information:
Name: Krutthika Hirebasur Krishnappa, Ph.D.
Office Location: N102, Thurman Hall
Office Phone: (225) 771-3773
Office Hours: MW: 10:30AM – 12:30PM 2:00PM – 3:00PM, TR: 10:00PM – 11:00PM
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Welcome to CMPS 393B MOBILE CLIENT DEVELOPMENT Fall 2023:

You have to put a lot of time and effort into this course. The instructor will keep posting the Assignments, Quizzes and additional materials for each module. The instructor will put several documents at the course site on MOODLE. Moreover, you need to carefully read the textbook chapters that are indicated.

Course Objectives
At the end of this course, the student will have broad knowledge on mobile application development, cellular communication technologies, computer network infrastructures, network traffic flow and control, mobile device configuration, and other advanced mobile application technologies.

This course addresses ABET Program Educational Objectives 1, 2, and 3. The Educational Objectives of CMPS394 of the Computer Science Program are to produce graduates who:
- Successfully enter the competitive job market or pursue advanced study. [PEO1]
- Are proficient in identifying, formulating, and solving a wide range of computing problems. [PEO2]

- Are capable of working collaboratively, and communicating effectively with team members, constituents, and the public. [PEO3]

Course Learning Outcomes

This course addresses ABET Program Student Outcomes 1, 2, 3 and 6. Each student will demonstrate,

- An ability to analyse a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions. [SO1]
- An ability to design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline. [SO2]
- An ability to communicate effectively in a variety of professional contexts. [SO3]
- An ability to apply computer science theory and software development fundamentals to produce computing-based solutions. [SO6]

Course Educational Strategies

- Provide clear lectures and discussions of major concepts of mobile computing deployment.
- Assign homework and programming projects to students to help them master the course materials delivered.
- Provide programming labs to enhance students' software implementation skill.
- Conduct quizzes and exams to urge students to review learned materials and check the level of mastery of the knowledge for each student.
- Collect comments and feedback from students.
- Welcome students to discuss any course-related issues.

Course requirements:

Examinations

Several written examinations, and a comprehensive final examination will be given. Examination dates will be announced at least 1 week in advance.

Quizzes and Homework

Quizzes will be given on MOODLE. Please note that there is no makeup quiz. No late quizzes will be accepted. If you miss a quiz, a score of zero is automatically assigned.

Projects

Several projects will be assigned along with the lecture topics.

Grading

Grading includes several exams, quizzes, assignments and projects. The final point total may be adjusted to reflect the actual number of assignments given.

Course Rules and Procedures:

Exam Information:

1. Exams will emphasize concepts developed in the course.
2. Exams will be closed book and notes unless stated.
3. Students will not be able to leave the classroom while they are taking an exam.
4. There will be no sharing of any materials (including calculators) during exams.
5. Communicating to one another is not permitted while taking an exam. If there are questions, they should be directed to the instructor. Students who communicate to one another will receive a zero for that exam.
6. A student who misses an exam will receive a zero unless the absence is legitimate and documented properly (e.g.,a letter from a court clerk stating that he/she must appear in court, a letter from physician that he/she was sick). Ifa student has foreknowledge of an absence, he/she should clear this with the instructor before missing class. There will be no make-up exams for unexcused absences or improperly documented absences.

Attendance policy and class participation: Students are expected to be present and be on time and participate in class from the beginning throughout the end of the class period. Though attendance is strongly encouraged, merely attending classes does not guarantee a passing grade. It is every student responsibility to make sure that he/she signs the roll in class when one is provided, or he/she pays attention during the roll call.

Makeup test or exam: No makeup test or exam will be given except in the case of emergency such as the student being sick, or he/she is unable to come to class due to some unforeseen event. An official proof MUST be presented to the instructor and student is required to take the makeup test/exam as soon he/she returns to class in the following class session. Failure to comply will result in the grade of zero (0) for the test/exam.

Use of electronic devices while in class: Students are not allowed to use the classroom computers or laptop during the lectures unless authorized by the instructor of this course for the purpose of the course. Please turn off (or place on silence) your cellular phones before the lecture starts.

Missing or late assignments/quizzes/exams: At the instructor's discretion, students may be given opportunity for late submission of an assignment or retake of a quiz or exam upon presentation of a valid excuse.

Course Communication
When sending any electronic correspondence (via your SUBR email address) to the instructor, please include the following:
- Subject: First and Last Name,
- Greeting: Dear Dr. Krutthika,
- Body of message: clearly state your concerns and/or problems, do not use text message lingo
- Signature: First and Last Name, Course Information

Note: If you have followed the above format, then you can expect that the professor or teaching assistant will respond to your e-mail message within 48 hours during the week. **Visit during office hours if an urgent issue surfaces.**

ACADEMIC DISHONESTY – Southern University and A&M College's Student Code of Conduct (Code 1.1) identifies academic dishonesty as any deliberate attempt to gain an unfair advantage in academic work. Examples of academic dishonesty include cheating, falsification of information, fraud, plagiarism, and unauthorized access to academic records, providing information, material, or other assistance with knowledge that such assistance could be used in violation of the Student Code of Conduct or other University policies, or providing false information in connection with any inquiry regarding academic dishonesty.

Academic Dishonesty Policy - link to PDF

ACADEMIC GRIEVANCES– Southern University and A&M College students may seek redress in academic decisions when they believe the decision is unfair or ungrounded. The academic grievance procedure provides prompt and equitable resolutions to student academic grievances. Classroom related matters should be subjected to these procedures only when the grievance cannot be settled in the ordinary course of immediate post-class discussion. Academic grievances are not handled by the Office of the Dean of Students.

Student Academic Grievance Procedures - link to PDF

ADA COMPLIANCE/DISABILITY SERVICES
Southern University Baton Rouge is committed to providing reasonable accommodations for students with documented disabilities in compliance with the American with Disabilities Act (ADA). Students may request accommodations by registering with the Coordinator for Disability Services. It is important to do this prior to the start of each semester because classroom accommodations are not retroactive. Upon approval and student verification of the application, the coordinator will be responsible for forwarding the letter of accommodations to the student's professors. Accommodations will begin upon acknowledgement that the professor has received the letter of accommodations. All discussions with the faculty/student/Coordinator will remain confidential.
Contact Information

The Office of Disability Services is in Office # 246, A. C. Blanks Hall, in the center of the campus.

Southern University Office of Disability Services
Jada J. Netters, Coordinator
P.O. Box 11298
Baton Rouge, LA 70813
Phone: (225) 771-3546 (V/TTDD)
Email: ods@subr.edu
Website: www.subr.edu/ods

The Office of Disability Services (ODS), under the auspices of the Department of Equity, Inclusion, and Title IX, assists students in meeting their unique academic/educational, personal, vocational, and social needs that would otherwise prove to be an obstacle to educational pursuits. The Office of Disability Services (ODS) provides confidential services to those students who, in this post-secondary setting must request and provide the necessary documentation to verify a special need request. Diagnostic educational evaluations/examinations are not conducted through ODS. Academic accommodations are made based on a student's documented disabilities.

DISRUPTION OF THE ACADEMIC PROCESS
The University's Student Code of Conduct (Codes 1.6 and 2.2) broadly defines disruption/obstruction as any major/minor action which obstructs, or attempts to obstruct, an official University function, such as teaching, research, administration, or other campus activity.

[Disruption Policy](#) - link to PDF

SOUTHERN UNIVERSITY STATEMENT OF NON-DISCRIMINATION
In compliance with Title IX of the Education Amendments of 1972, Title VI and VII of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, and other federal, state, and local laws, Southern University and A&M College forbids discriminating or harassing conduct that is based on an individual's race, color, religion, sex, ethnicity, national origin or ancestry, age, physical or mental disability, sexual orientation, gender identity, gender expression, genetic information, veteran or military status, membership in Uniformed Services, and all other categories protected by applicable state and federal laws. This commitment applies but is not limited to decisions made with respect to hiring and promotion, the administration of educational programs and policies, scholarship and loan programs, and athletic or other College administered programs. Discriminatory acts of any kind are strictly forbidden.
Any member of the Southern University and A&M College community has the right to raise concerns or make a complaint regarding discrimination without fear of retaliation. All inquiries regarding the application of this statement and related Title IX policies may be referred to:

Dr. Akai Smith Associate Vice Chancellor of Equity, Inclusion, and Title IX (225)771-4955
and/or
Dawn Harris Human Resources Director (225)771-2680

STANDARDS FOR SATISFACTORY ACADEMIC PROGRESS
The Higher Education Act of 1965 as amended and final regulations set by the United States Department of Education (34CFR668.16) require that institutions of higher education establish reasonable standards of Satisfactory Academic Progress (SAP) as a condition of continuing eligibility for federal aid programs. Financial aid recipients are expected to make reasonable progress as a condition of receiving and continuing to receive student financial aid. Student progress is assessed according to both qualitative and quantitative measures. The University has developed this policy to provide a framework for monitoring and determining a student's Satisfactory Academic Progress in accordance with Federal and Institutional requirements. This policy applies to all new, transfer, re-entry, re-admit with transfer work, and continuing students at Southern University.

For additional information, please see the [Satisfactory Academic Progress policy](#).

STUDENT EMAIL POLICY
Email is a universal service that has greatly enhanced communication both internally within the Southern University and A&M College community and externally to users, including prospective students, alumni, and the public at large. The purpose of the University's general email policy is to describe the appropriate use of University email facilities, associated responsibilities, and rights of all users of University email facilities and official Southern University and A&M College email accounts. This student email policy is a supplement to the University's general email policy.

[Student Email Policy](#) - link to PDF

TOBACCO FREE CAMPUS POLICY
The Southern University System (SUS) maintains a 100% Tobacco-Free Policy. Smoking and tobacco use of any kind will be prohibited on all SUS campuses and/or other properties owned and/or leased locations/premises; all internal and external areas, parking garages, and parking lots; all entrances and exits; and in all SUS owned and/or leased vehicles. Students may not smoke in their own or others' vehicles when the vehicles are parked on SUS properties. This policy will be in place at all Southern University and A&M College sponsored events-both on our premises and at external locations hosting such events, including non-University hours and will further apply to all faculty, staff, students and visitors.

SUBR Tobacco Free Policy - link to PDF

WATERMARK-COURSE EVALUATION
Course Evaluations & Surveys by Watermark is an easy-to-use course evaluation system that integrates directly with Moodle. You will receive an email when the evaluation survey is available. The email will provide more information as well as a link and instructions on how to access the evaluation. We encourage you to be open and honest in these evaluations. Your identity will be kept private, and your instructor will not see the results of your evaluation until classes have ended. No identifying information is ever directly connected to the feedback you submit.

FOLLETT ACCESS TEXTBOOK PROGRAM
Follett Access is a partnership between the Southern University System and the SUBR Bookstore that allows you to rent textbooks at a reduced cost. The charge is posted directly to your SUBR tuition and fees bill and are paid along with your University charges. Students are able to opt out of Follett Access. If you choose to opt out of the program, be aware that you are opting out for the entire semester schedule. You may not opt out for individual courses. Fees will be refunded on your SUBR account after the add/drop date for each semester. To opt out of Follett Access, create an account on the Follett Customer Portal and follow prompts to opt out.

For more information about the program, including information about accessing your textbooks, opt-out deadlines, and more resources, refer to the Follett Access Textbook Program guide. For assistance, contact the Bookstore at (225) 771-1472 or 0622txt@follett.com.

MENTAL HEALTH RESOURCES
Mental health resources and support are available from the University Counseling Center (UCC). The staff at UCC is trained to help you navigate the challenges and opportunities that arise for college students. The UCC provides free individual/couple counseling, crisis intervention, and other psychological services in a safe and confidential setting.
For mental health resources or to schedule an appointment, students may contact the University Counselling Center at counselingcenter@subr.edu or by calling (225) 771-2480. If you are experiencing an emergency, call 911.

MOODLE ACCESS – Southern University and A&M College at Baton Rouge will used Moodle extensively in this course. Moodle is a learning management system designed to help teachers and students communicate effectively online. The course syllabus, class materials (e.g., handouts, PowerPoint slides, journal articles, assignments, readings, etc.) will be placed on Moodle. The student should check Moodle DAILY for all assignments submitted via Moodle. If the student has problems with his Moodle account, he/she should contact the Division of Information Technology at (225) 771-4357 8 am – 5 pm Monday – Friday or the SU OneStop HelpDesk Support at 877-771-0621 24 hours a day; 7 days a week.

Grading Distribution:

Course Work	Approx. weight in grade
Assignment	10%
Quiz and programming assignment	35%
Midterm	25%
Final	30%
Total	**100%**

Grading Scale:

Course Work	Approx. weight in grade
90% – 100%	A
80% – 89%	B
70% – 79%	C
65% – 69%	D
Below 65%	F

Final GPA = AS*0.10 + Q&P * 0.35 + MT * 0.25 + FE * 0.30

Course Objectives

By the end of the course students will be able to:

Course Objectives	Program Goals	Evaluation
CO 1) Apply the basic knowledge on the diverse networks, its topologies, components, protocols and the different layers of the OSI and TCP/IP model to ensure the error free transmission of data	To develop a level of competence in understanding the meaning of Data communication and its models. The standard protocols and its applications are discussed.	Assignments and Quiz with questions involving matching, true and false questions & simple "fill in the blanks" questions.
CO 2) Design subnet masks and addresses to accomplish networking requirements	To develop a level of competence in applying Subnetting concepts to allow for solving simple problems and applications.	Assignments, quiz, Essay
CO 3) Analyze different techniques and models in the cellular networks.	To prepare students to understand the basic principles of mobile communication and also analyses various models.	More complex problem solving in the assignments, and quizzes

CO 4) Apply design trouble shooting and restoring techniques for different scenario's.	To demonstrate a level of competence in applying advanced trouble shooting techniques to solve and restore the network.	Solving problems on assignments and using techniques.
CO 5) Able to device operation and management techniques in mobile communication.	To prepare students use the techniques that manages and operates mobile communication.	Student write essay on techniques used for managing the mobile communication.
CO 6) Examine how mobile technology handles various scenarios in Mobile communication.	To prepare students to understand the various scenarios in Mobile communication.	Assignments and quiz

Course Modules:

All the Modules are described in detail. The course has from Module 1 through Module 15.

Module 0: Start Here
Students are given an overview of the course in each module. You may find various preparation tips under the Introduction to CMPS 393B Mobile Client Development Fall 2023 section. Together with the course exams and the assessments used to assign grades, the course objectives have all been made apparent.

<u>UNIT I</u>
Module 1: Computer Networks The text material for this unit include Power point presentation placed on Moodle in the module 1 section.
    MLO 1: Describe the data communication and its applications   **(CO 1)**
    MLO 2: Describe the Principle of data communication to various networks   **(CO 1, CO 2)**
    MLO 3: Describe Applications of data communication   **(CO 1, CO 2)**
    MLO 4: Extend the applications of topologies and connection types present in all the layers   **(CO 1, CO 2)**
    MLO 5: Achieve a score of $\geq$ 60 % on an assignment & quiz covering the topics in **Module 1 (CO 1, CO2)**

Module 2: Network Protocols   (Study chapter 21 of the course textbook and see the recommended information in the course schedule.)
    MLO 1: Describe the concept of OSI and TCP/IP protocol suit **(CO 1, CO 2)**
    MLO 2: Describe the applications of the Network protocols   **(CO 1, CO 2)**
    MLO 3: Describe the addresses present in all the layers of the TCP/IP protocol suit **(CO 1, CO 2)**
    MLO 4: Achieve a score of $\geq$ 60 % on an assignment & quiz covering the topics in **Module 2   (CO 1, CO 2)**

Module 3: Radio technology and wireless technology
    MLO 1: Describes the basics of radio frequency (RF) technology in wireless LAN and cellular **(CO 1, CO2, CO3)**
    MLO 2: Explore some of the basic RF concepts and provide a better understanding of the technology. **(CO 1, CO 3, CO 4)**
    MLO 3: Describe and analyze antenna technology and see various antenna types that are used with different wireless technologies. **(CO 2, CO 4)**
    MLO 4: Achieve a score of $\geq$ 60 % on an assignment & quiz covering the topics in **Module 3 (CO 1, CO 2, CO 3, CO 4)**

Module 4: Computer network infrastructure devices
    MLO 1: Describes a variety of infrastructure devices, including wireless access points, wireless mesh devices, wireless bridges, wireless repeaters, hardware wireless LAN controllers, and cloud-managed wireless **(CO 1**)
    MLO 2: Describes the concepts of Power over Ethernet (PoE) and of other network infrastructure devices, including virtual private network (VPN) concentrators, network gateways, and network proxy devices. **(CO 1, CO 2, CO 4)**
    MLO 3: Achieve a score of $\geq$ 60 % on an assignment & quiz covering the topics in **Module 4 (CO 1, CO 2, CO 3, CO 4)**

Module 5: Cellular communication technology
    MLO 1: Understand that IEEE 802.11 wireless networking and cellular technology are both key components of mobile computing deployment and **(CO 1)**
    MLO 2: Identify equipotential lines and surfaces and apply them to simple problems **(CO 1, CO 2)**
    MLO 3: Describes the common communications methods used with wireless mobile devices and cellular technology, including how cellular technology has evolved and common access methods that are used with **(CO 2, CO 3)**
    MLO 4: Achieve a score of $\geq$ 60 % on an assignment & quiz covering the topics in **Module 5   (CO 1, CO 2, CO 3, CO 4, CO5)**

Module 6: IP address and Subnetting
    MLO 1: Describe the concept and definition IPV4 and IPV6 **(CO 1, CO2)**
    MLO 2: Apply subnetting concepts for different sizes of networks **(CO 1, CO2, CO 4)**
    MLO 3: Design and apply subnetting for different applications **(CO 1, CO 3)**
    MLO 4: Achieve a score of $\geq$ 60 % on an assignment & quiz covering the topics in **Module 6   (CO 1, CO 2, CO 3, CO 4)**

Module 7: Network traffic flow and control
    MLO 1:   Describe the traffic flow for local area networks and wide area networks, including Network layer **(CO 1, CO 2, CO3)**
    MLO 2: Explore traffic shaping techniques, bandwidth restrictions, and quality of service **(CO 1, CO 2)**
    MLO 3:   Achieve a score of $\geq$ 60 % on an assignment & quiz covering the topics in **Module 7   (CO 1, CO 2, CO 3)**

Module 8: Mobile device management
    MLO 1: Describe the basics of mobile device management (MDM) **(CO 1, CO 2)**
    MLO 2:   Describe the on-premise and cloud-based Software as a Service (SaaS) solutions and many of the related features of MDM solutions. **(CO 1, CO 2, CO 3)**
    MLO 3: Achieve a score of $\geq$ 60 % on an assignment & quiz covering the topics in **Module 8   (CO 1, CO 2, CO 3, CO 4)**

Module 9: Mobile device configuration
    MLO 1: Describe provide a basic outline of some of the more common policy components that fit in as a framework for most organizations. **CO 1, CO 2)**
    MLO 2: Describe some of the basic components of a network security policy. **(CO 1, CO 2, CO 3)**
    MLO 3: Achieve a score of $\geq$ 60 % on an assignment & quiz covering the topics in **Module 9 (CO 1, CO 2, CO 3, CO 4)**

Module 10: Practices and implementation of mobile technology
    MLO 1: Describe proper implementation techniques will help to provide a successful technology deployment of any **(CO 1, CO 2, CO 4)**
    MLO 2: Apply the System Development Life Cycle (SDLC) and pilot programs are only part of the entire **(CO 3, CO 4)**
    MLO 3: Achieve a score of $\geq$ 60 % on an assignment & quiz covering the topics in **Module 10   (CO 1, CO 2, CO3, CO 4)**

Module 11: Mobile device operation and management

MLO 1: Explore solutions that are available for mobile device content management and distribution, which includes enterprise-server-based and cloud-based **(CO 1, CO 2,CO 3)**

MLO 2: Explore mobile device remote management capabilities such as remote control, remote lock, and remote **(CO 1, CO 2, CO 4)**

MLO 3: Explore change management and the end-of-life process. **(CO 1, CO 2, CO 3 CO 4)**

MLO 4: Achieve a score of ≥ 60 % on an assignment & quiz covering the topics in **Module 12 (CO 1, CO 2, CO 3)**

Module 12: Mobile application configuration

MLO 1: Describe the awareness of mobile technology advancements, which includes understanding the importance of changes to the actual hardware devices **(CO 1, CO5, CO6)**

MLO 2: about the requirements for application (app) types that may be used within an organization's deployment: in-house, custom, and purpose-built apps. **(CO 1, CO5, CO6)**

MLO 3: Achieve a score of ≥ 60 % on an assignment & quiz covering the topics in **Module 13   (CO 1, CO 2, CO 4, CO5,CO6)**

Module 13: Security in mobile devices and applications

MLO 1: Recognize the explore the security risks and threats that may have an impact on mobility **(CO 4)**

MLO 2: Interpret the risks associated with wireless (radio frequency) technology, software, and hardware and the risks within an organization itself. **(CO 1, CO5, CO6)**

MLO 3: Achieve a score of ≥ 60 % on an assignment & quiz covering the topics in **Module 13   (CO 1, CO 4, CO5, CO6)**

Module 15: Data backup and restore

MLO 1: Describe the data backup and planning for various disasters **(CO 4, CO5)**

MLO 2: Describe Data and configuration information backup is an essential part of all aspects of information technology, and mobile devices are no exception **(CO 4, CO5)**

MLO 3: Describe data backup and recovery solutions for both network servers and client or mobile devices and common disaster recovery procedures, high availability, backup, and restore for both the server side and the client device side. **(CO 4, CO5, CO6)**

MLO 4: Achieve a score of ≥ 60 % on an assignment & quiz covering the topics in **Module 14 (CO 4, CO5, CO6)**

Module 15: Trouble shooting in mobile deployment

MLO 1: Describe Troubleshooting for different cases **(CO 4, CO 5)**

MLO 2: Describe troubleshooting wireless and mobile device technology will encounter many of the same problems that occur with wired networking plus others that are a result of the fact that wireless technologies use radio frequency. **(CO 4, CO 5)**

MLO 3: Achieve a score of ≥ 60 % on an assignment & quiz covering the topics in **Module 15   (CO 4, CO 5, CO6)**