

# CSE 5432: Mobile Handset Systems and Networking

## Course Description

Mobile handset architecture: processors, memory, I/O devices, sensors, virtual machine and power management; different ranges of wireless communication technologies; TCP/IP over wireless; mobile social networking.

**Transcript Abbreviation:** Mobile Sys & Net

**Grading Plan:** Letter Grade

**Course Deliveries:** Classroom

**Course Levels:** Undergrad, Graduate

**Student Ranks:** Senior, Masters, Doctoral

**Course Offerings:** Autumn, Spring

**Flex Scheduled Course:** Never

**Course Frequency:** Every Year

**Course Length:** 14 Week

**Credits:** 3.0

**Repeatable:** No

**Time Distribution:** 3.0 hr Lec

**Expected out-of-class hours per week:** 6.0

**Graded Component:** Lecture

**Credit by Examination:** No

**Admission Condition:** No

**Off Campus:** Never

**Campus Locations:** Columbus

**Prerequisites and Co-requisites:** CSE 2421 or ((ECE 2560 or ECE 265) and (CSE 2451 or CSE 459.21))

**Exclusions:**

**Cross-Listings:**

**Course Rationale:** Existing course.

**The course is required for this unit's degrees, majors, and/or minors:** No

**The course is a GEC:** No

**The course is an elective (for this or other units) or is a service course for other units:** Yes

**Subject/CIP Code:** 14.0901

**Subsidy Level:** Doctoral Course

## Programs

Abbreviation	Description
BS CSE	BS Computer Science and Engineering
MS CSE	MS Computer Science and Engineering
PhD CSE	PhD Computer Science and Engineering

## Course Goals

Be competent with mobile handset architecture processors, memory, I/O devices and sensors
Be familiar with mobile handset virtual machine and power management
Be competent with different ranges of mobile handset wireless communication technologies and TCP/IP over wireless
Be familiar with mobile social networking

## Course Topics

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Mobile handset: history and trends; overview of mobile handset systems architecture and operating systems; overview of mobile handset networking	3.0							
Mobile handset processor architecture; memory systems; I/O devices and sensors	9.0							
Virtual machine; system power management	9.0							
GSM/3G/LTE (Long Term Evolution; WiFi direct; Bluetooth, Zigbee, NFC and other short range communication technologies; TCP/IP over wireless on mobile handsets; networking power management	13.0							
Mobile social networking; security	6.0							

## Representative Assignments

Designing a power-efficient process scheduling algorithm for mobile handsets
Designing and building an ad hoc mobile handset network via short-range wireless communication channels
Designing a multi-cast protocol for mobile handset networks

## Grades

Aspect	Percent
Written assignments (4)	15%
Project and presentation	25%
Midterm exam	25%
Final exam	35%

## Representative Textbooks and Other Course Materials

Title	Author
<i>Mobile Handset Design</i>	Sajal K. Das
<i>Smart Phone and Next Generation Mobile Computing</i>	Pei Zheng and Lionel M. Ni

## ABET-EAC Criterion 3 Outcomes

Course Contribution		College Outcome
**	a	An ability to apply knowledge of mathematics, science, and engineering.
**	b	An ability to design and conduct experiments, as well as to analyze and interpret data.
**	c	An ability to design a system, component, or process to meet desired needs.
**	d	An ability to function on multi-disciplinary teams.
***	e	An ability to identify, formulate, and solve engineering problems.
**	f	An understanding of professional and ethical responsibility.
*	g	An ability to communicate effectively.
*	h	The broad education necessary to understand the impact of engineering solutions in a global and societal context.

Course Contribution		College Outcome
*	i	A recognition of the need for, and an ability to engage in life-long learning.
*	j	A knowledge of contemporary issues.
***	k	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

## BS CSE Program Outcomes

Course Contribution		Program Outcome
**	a	an ability to apply knowledge of computing, mathematics including discrete mathematics as well as probability and statistics, science, and engineering;
**	b	an ability to design and conduct experiments, as well as to analyze and interpret data;
**	c	an ability to design, implement, and evaluate a software or a software/hardware system, component, or process to meet desired needs within realistic constraints such as memory, runtime efficiency, as well as appropriate constraints related to economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability considerations;
**	d	an ability to function on multi-disciplinary teams;
***	e	an ability to identify, formulate, and solve engineering problems;
**	f	an understanding of professional, ethical, legal, security and social issues and responsibilities;
*	g	an ability to communicate effectively with a range of audiences;
*	h	an ability to analyze the local and global impact of computing on individuals, organizations, and society;
*	i	a recognition of the need for, and an ability to engage in life-long learning and continuing professional development;
*	j	a knowledge of contemporary issues;
***	k	an ability to use the techniques, skills, and modern engineering tools necessary for practice as a CSE professional;
**	l	an ability to analyze a problem, and identify and define the computing requirements appropriate to its solution;
**	m	an ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices;
**	n	an ability to apply design and development principles in the construction of software systems of varying complexity.

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