

Mobile Game Programming

ITP 382 (4 Units)

Objective This course is an extensive overview of the latest in mobile gaming. Students will learn how to develop interactive games for a variety of mobile devices including cell phones, PDAs and Pocket PCs. The course culminates with the completion of your very own interactive game on your chosen platform.

Knowing how to develop quality games for mobile platforms is increasingly important, as the mobile gaming market continues to explode. Mobile games run on less powerful devices than their PC counterparts with smaller screens and controls designed for telephony – but they are also running on devices that are portable, ubiquitous, and networked. They offer the potential for a whole new style of game: not media poor by comparison to PC or console games, but communication rich. This course will enable students to develop to this specification with both creativity and confidence.

Concepts

- Processor-Limited Environments
- Dynamic Memory and Limited Environments
- Static Storage Limitations
- Network and Online Gaming
- The Mobile Market

Prerequisite Previous Programming Experience

Lecture 3 hrs/week

Lab 2 hrs/week

Required Textbooks

- *Pocket PC Game Programming Using the Windows CE Game API*, by Jonathan S. Harbour, Prima Publishing. 2001. ISBN: 0-7615-3057-6.
- *Palm OS Game Programming*, by Nicholas Pleis, Prima Publishing. 2002. ISBN: 1-931841-19-5.
- *Building Great Flash MX Games*, by Matthew David, Wiley Publishing, Inc. 2003. ISBN: 0-7645-1985-9.
- *Micro Java Game Development*, by David Fox and Roman Verhovsek, Addison Wesley Professional. 2002. 0-672-32342-7.
- *Software Development for the QUALCOMM BREW Platform*, by Ray Rischpater, Apress. 2003. ISBN: 1-59059-116-X.
- *Mobile .NET*, by Derek Ferguson, Apress. 2001. ISBN: 1-893115-71-2.

Grading The following point-structure will be used in determining the grade for the course. Final grade will be based upon the total points received, the highest total in the class, and the average of the class.

Labs	25%
Midterm	20%
Final Project	25%
Final Exam	30%
Total	100%

Examinations Exams cover material from the reading assignments, lectures, and lab projects. The exams are both closed book and closed notes. The exams will cover the material presented up to the date of the exam. The Final exam is not considered to be cumulative, though knowledge of the material presented during the earlier part of the semester may be helpful in answering some of the questions on the Final.

Students with Disabilities Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to your lab assistant) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m. - 5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

- Policies**
- Make-up policy for exams: In order to make up for a missed exam, the student must provide a satisfactory reason along with proper documentation. Usually make-ups are allowed only under extraordinary circumstances.
 - Projects: It is YOUR responsibility to turn in your lab projects on, or before, the deadlines as set by the instructor.
IT IS NOT THE RESPONSIBILITY OF THE LAB ASSISTANT!
 - Late Projects: Late submission of projects will lead to loss on points, so please turn in your projects on time! No projects will be accepted after 2 weeks beyond the project's original due date. Everything regarding a project should be settled within 2 weeks of the project's due date.
 - Due Dates: All projects must be submitted by midnight on the due date.
 - Though working together is encouraged, the projects must be your own effort. "Duplicate" projects will all receive zero points and possible referral to the Office for Student Conduct.
 - All students should abide by the University Student Conduct Code <http://www.usc.edu/dept/publications/SCAMPUS/governance/gov03.html>

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Course Outline

Week 1 – Pocket PC Game Programming

- Introducing Microsoft Pocket PC
- The Art of Game Design for Pocket PC
- Pocket PC Game Programming Tools
- Windows CE Programming in a Nutshell
- Writing Your First Pocket PC Program

Reading Assignment: *Pocket PC Game Programming* Chapters 1-5

Lab: None

Week 2 – Building A Custom Pocket PC Library

- Using the Pocket PC Game API
- The Game Library
- Bitmaps
- Sprites and Animation
- Sound Effects and Music
- Button and Stylus Input
- Alien Invasion

Reading Assignment: *Pocket PC Game Programming* Chapters 6-12

Lab:

- Hello World
- Graphics Test
- Pocket Trivia
- Blackout
- UFO Project
- Fish Aquarium
- Wave Test
- Perfect Match
- Alien Invasion

Week 3 – Advanced Pocket PC Game Programming Techniques

- Strategy and Tactics
- Game Physics
- Infrared and Socket Communications
- Multiplayer Game Programming

Reading Assignment: *Pocket PC Game Programming* Chapters 13-16

Lab:

- Tank Battle
- Meteoroids
- Pocket Air Hockey

Week 4 – Macromedia Flash MX Game Programming – Tools of the Trade

- Macromedia Flash MX – The Game Developer’s Platform
- Developing and Storyboarding a Game
- ActionScript: The Foundation of Creating Games with Flash MX
- Collision Detection
- Managing Sound
- Adding Video
- Creating 3D Elements
- Optimizing Bandwidth for Enhanced Experience
- Creating Dynamic Games Using Databases
- Multi-User Games

Reading Assignment: *Building Great Flash MX Games* Chapters 1-10

Lab:

- Flash Programming I Demo

Week 5 – Macromedia Flash MX Game Programming – Building Games

- Puzzle Games
- Arcade Games
- Flasher Man Adventure Game
- 3D Games
- PDA Games

Reading Assignment: *Building Great Flash MX Games* Chapters 11-15

Lab:

- Flash Programming II Demo

Week 6 – Palm OS Game Programming

- Getting Started
- The Hardware
- Writing Your First Program
- The Bare Essentials
- Reading and Writing Files
- Bring on the Sprites
- Input
- Working with Tiles
- Physics: The Science of Your World
- Bringing It All Together: Building a Reusable Game Engine

Reading Assignment: *Palm OS Game Programming* Chapters 1-10

Lab:

- PGL-man

Week 7 – Advanced Palm OS Game Programming Techniques

- Multiplayer Games
- Artificial Intelligence
- Advanced Topics
- Publishing Your Palm Game

Reading Assignment: *Palm OS Game Programming* Chapters 11-14

Lab:

- Extending PGL-man

Week 8 – Midterm

Reading Assignment: All prior material

Week 9 – Java 2, Micro Edition Game Programming – The Basics

- Introduction
- Mobile World
- Big Games, Small Screens
- Wireless Standards: How Data Goes To and Fro
- Let's Talk: Instant Wireless Messaging
- Wireless in Asia: i-mode and cHTML
- The Wireless Landscape
- J2ME Overview
- Creating a MIDlet
- Making the Most of Limited Resources
- Making the Most of It: Optimizations
- Multithreaded Game Programming

Reading Assignment: *Micro Java Game Development* Chapters 1-12

Lab:

- J2ME Demo I

Week 10 – Java 2, Micro Edition Game Programming – Advanced

- High-Level Graphical User Interfaces
- Working with Graphics: Low-Level Graphical User Interfaces
- Entering the Land of Sprites
- Managing Your Sprites
- Sprite Movement
- J2ME Audio Basics
- Be Persistent: MIDP Data Storage
- Connecting Out: Wireless Networking
- PersonalJava, Connected Device Configuration, and Other Micro Java Blends
- iAppli: Micro Java with a Twist
- Siemens Game API
- Micro Racer: Putting It All Together

Reading Assignment: *Micro Java Game Development* Chapters 13-24

Lab:

- Micro Racer

Week 11 – Microsoft's .NET

- Meet .NET
- Web Applications
- Web Services
- Mobile Information Server
- Using the Mobile Controls SDK
- Extending the Mobile Controls SDK

Reading Assignment: *Mobile .NET* Chapters 1-14

Lab:

- Mobile .NET Demo

Week 12 – Motorola's MotoCoder

- Programming the Motorola T720 Mobile Phone
- The T720 Mobile Phone
- An Overview of J2ME as it relates to Motorola
- Motorola's Lightweight Windowing Toolkit (LWT)
- Variations on a Theme

Reading Assignment: Instructor Handout

Lab:

- T720 Demo

Week 13 – Nokia Game Development

- Series 60 UI Design for Symbian C++
 - Application Architecture
 - Resource Files
 - Series 60 Application Framework
 - Using Menus
 - Command Handling
 - Installation Files
 - N-Gage Mobile Game Deck Development
- Reading Assignment:** Instructor Handout
Lab:
- Nokia Demo

Week 14 – Qualcomm’s Binary Runtime Environment for Wireless

- Introduction
- Introducing the QUALCOMM BREW Platform
- Designing for the BREW platform
- Developing for the QUALCOMM BREW platform
- Handling Events
- Interacting with the User
- Storing Data
- Drawing Graphics
- Playing with Sounds
- Networking your Data
- Controlling your Handset
- Certifying your Application

Reading Assignment: *QUALCOMM BREW Platform* Chapters 1-12

Lab:

- BREW Demo

Week 15 – Synergenix’s Mophun Game Engine

- Introduction
- The Essentials of Mophun
- Your First Program in Mophun

Reading Assignment: Instructor Handout

Lab:

- Mophun Demo

Week 16 – Final Examination