

**UCSD Extended Studies
Business, Science and Technology Department**

**BREW Software Development
CSE-40729**

Course Syllabus

Basic Information:

- Instructor: Fredric Raab
- Email: fred@fredraab.com
Please include BREW: in the subject
- Website: www.FredRaab.com/brew

- Quarter: Fall 2008
- Credit: 3 units in Computer Science & Engineering
- Date/Time: Thursdays, Sept 26-Oct30 6:30-10:00pm
- Location: La Jolla, Extension Complex Room 132

Course Description:

This Qualcomm-approved, hands-on course provides the information needed to design and build software applications for Qualcomm's Binary runtime Environment for Wireless (BREW) platform. BREW provides software developers with a standardized API for addressing the functions of the CDMA chipset. This highly focused course concentrates on practical, hands-on experience developing BREW applications using the SDK and tools provided by Qualcomm.

Course Goals:

The goal of the BREW Software Development course is to provide students with the knowledge and skills needed to develop and deploy applications that execute on wireless devices using the BREW operating environment. Students will utilize the basic and advanced features of wireless devices using the Binary Runtime Environment for Wireless (BREW). Students will understand and be able to use the tools provided by BREW to design, develop, test, and deploy applications.

Course Objectives:

At the end of the course the student will be able to:

- Define the impact that carriers, handset developers, application developers, and consumers have on wireless applications.
- Describe and use the BREW Application Execution Environment (AEE) and resource files.
- Describe and implement in an application program, the functions provided by the BREW API. These include:
 - Shell functions
 - Display functions

- Menu functions
 - File and database functions
 - Sound functions
 - Graphics functions
 - Networking functions
 - Camera phone functions
 - GPS and position determination functions
 - New Version 3.0 functions
- Describe and execute the processes and tools needed to load an application on a device.
 - Discuss design guidelines and best practices used to develop BREW applications.
 - Use troubleshooting techniques to debug code in the SDK Emulator.
 - Describe the steps for quality testing BREW applications through "True BREW" testing.

Student/Course Requirements:

Experience with C or C++ required.

Student must have access to Microsoft Visual Studio (6.0 or .NET) to complete project.

Course Materials:

- Workbook: BREW Developer Student Guide (Provided)
- BREW SDK Ver 3.1.4 (downloaded from QUALCOMM website)
- Supplemental teacher handouts

Grading System:

- 70% Class project – requirements described in attached document
 - Due day of last class – Oct 30
 - Graded as follows:
 - Complete, but non-working code: C
 - Working code meets minimal requirements: B
 - Program demonstrates additional APIs: -A, A, A+
- 30% Class 4 Take-home Midterm
 - Due the following week – Oct 23
 - Covers material from Classes 1 – 4

Course Structure

Class 1

Workbook Section 1 - BREW Environment and Architecture

Module 1.1 Course Introduction

- Module and Course Objectives
- Course Structure

Module 1.2 BREW Environment and Architecture

- Wireless Landscape
- BREW Customer Experience
- BREW Download Process
- Handset Software

Module 1.3 BREW Application Development Basics

- Application Development Tools
- Using the BREW Simulator
- Building a BREW Project
- BREW API Overview

Class 2

Module 1.4 Overview of Fundamental APIs and Data Types

- BREW API Services
- IShell
- IDisplay
- Helper Functions and Macros
- Data Types

Workbook Section 2 - Interface Development

Module 2.1 Event Handling

- The BREW Event Model
- The HandleEvent() Function
- System, Application and User Events
- Event Delegation

Class 3

Module 2.1 Building UI Controls

- BREW UI Controls Overview
- Menu Controls
- Text and Static Controls

- Date, Time and Other Entry Controls

CLASS 4

Workbook Section 3 - Working with Persistent Data

Module 3.1 File I/O Programming

- SDK and Device File System Structure
- File Management Interfaces - IFileMgr and IFile
- Database Management Interfaces - IDBMgr, IDatabase and IRecord

Workbook Section 4 - Graphics and Multimedia

Module 4.1 2D Graphic Development

- 2D Primitives Provided by IGraphics
- Coordinate Systems
- Viewing Transformation

Module 4.2 Working with Images and Bitmaps

- IImage
- IImageCtl
- Animation using the IImage API

Class 5 Midterms Due – OCT 23

Review Mid-term

Module 4.3: Adding Sound and Music

- Basic Sound Services with ISound
- Complex audio rendering with Imedia

Misc BREW APIs

- Camera phone
- Sprites
- 3D Graphics

Class 6 – FINAL PROJECT DUE – OCT 30

Workbook Section 5 - Wireless Connectivity with BREW

Module 5.1 Telephony and SMS

- Telephony Services Overview
- Voice and Data Calls
- Working with SMS
- GPS and Position Determination

Module 5.2 Networking Overview

- The BREW Networking Architecture
- INetMgr and ISocket Interfaces
- Building Network Connections
- Socket Connectivity and Communications

Module 5.3 Retrieving Web Content

- IWeb and Other Web Interfaces
- Reading Data Through ISource Data Abstraction

Section 6 - Testing and Commercialization

Module 6.1 BREW Authenticated Developer Overview

- Authentication Process
- Tools for Authenticated Developers

Module 6.2 Testing Applications on a BREW Device

- The BREW Device Environment
- Compiling for BREW Devices
- The BREW AppLoader
- Troubleshooting and Debugging

Module 6.2 Building Usage-based Applications

- Usage-based Applications
- Maintaining Usage with ILicense

Module 6.4 TRUE BREW Testing (TBT)

- TRUE BREW Testing Process
- Test Cases
- Preparing Applications for TBT

Module 6.6 BREW Developer Alliance

- Program Overview
- Membership Levels and Benefits

- Wrap-up
- Class Project Discussion
- Final Q&A