LONG SIGNATURE SHEET

Proposal Number: SIS 2010-11-23

UNC CHARLOTTE

Proposal Title: Mobile Application Development (ITIS 5180)

Originating Department: Software and Information Systems

TYPE OF PROPOSAL: UNDERGRADUATE_____ **GRADUATE** __X__ **UNDERGRADUATE & GRADUATE**____
(Separate proposals sent to UCCC and Grad. Council)

DATE RECEIVED	DATE CONSIDERED	DATE FORWARDED	ACTION	SIGNATURES
11/18/11	11/18/11	11/18/11	Approved	**DEPARTMENT CHAIR** Dr. Bill Chu
11/18/11	11/18/11	11/18/11	Approved	**COLLEGE CURRICULUM COMMITTEE CHAIR** Dr. Anthony Fodor
11/18/11	11/18/11	11/18/11	Approved	**COLLEGE FACULTY CHAIR (if applicable)** Dr. Barry Wilkinson
11/18/11	11/18/11	11/18/11	Approved	**COLLEGE DEAN** Dr. Teresa Dahlberg
			Approved	**GENERAL EDUCATION** (for General Education courses)
			Approved	**UNDERGRADUATE COURSE & CURRICULUM COMMITTEE CHAIR** (for undergraduate courses)
12-5-11	2-7-12	10-2-12	Approved	**GRADUATE COUNCIL CHAIR** (for graduate courses) Rob Roy McGregor
			Approved	**FACULTY GOVERNANCE ASSISTANT** (Faculty Council approval on Consent Calendar)
				FACULTY EXECUTIVE COMMITTEE (if decision is appealed)

New Graduate/Undergraduate Course and Curriculum Proposal from the Department of Software and Information Systems

Title: Mobile Application Development

1. Proposal Summary and Catalog Copy

1. Summary

The Department of Software and Information Systems proposes to add a new cross-listed course to its graduate (Masters) and undergraduate curriculum.

2. Proposed Catalog Copy

ITIS 4180 Mobile Application Development (3) Cross-listed as ITCS 4180. Prerequisite: ITCS 2214, or permission of the department. Mobile platforms are at the center of attention of users and organizations nowadays. Most organizations and businesses are rapidly migrating toward the cloud and need to provide a fast and easy mechanism for users to stay connected to their services. Mobile applications are the top trend nowadays given the high variety of new mobile devices and platforms such as Apple's iOS and Google's Android. In this course, students will be introduced to the foundations of mobile development and its unique requirements and constraints. Students will design and build a variety of mobile applications with a hands-on and project-based approach. *(On demand)*

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2. Justification

1. **Needs** There is an increasing trend nowadays towards providing services through mobile applications. This is driven by the variety of robust mobile platforms that allow users to effectively stay connected to different cloud services and by the convenient experience mobile applications provide. This triggered a high demand for mobile application designers and developers. This course will prepare students to tackle the market needs for mobile application developers by introducing them to the latest mobile platforms such as Apple's iOS and Google's Android. Students will also learn and adapt to the unique requirements and constraints that exist within mobile development environments, e.g. the limited memory and processing power available on mobile devices.
2. **Student preparations.** Programming experience will be required. Java or equivalent object oriented programming language is required. The course will tackle mobile development gradually through a hands-on and project-based approach. This will help students get hold of the nature of mobile development in an easier fashion.
3. **Course level.** The course will suit both undergraduate and graduate students, especially those with a stronger programming background.
4. **Program Synergy** This course presents students with the nature of mobile application development, which is different from that of desktop development. Students will get to know the various requirements and design decisions tied to mobile application development and how they can deal with the limited resources available on mobile devices.

3. Impact

- **Target student population.** This course is designed for students in both the undergraduate and graduate population who want to expand upon their programming experience. Students with desktop programming experience will get to know the ins and outs of mobile development and its various constraints. This course will also be of

high value and serve the educational needs of local and regional professionals who are seeking knowledge on this important subject.

- **Effect on curricula**
  a) The course will be taught on demand.
  b) The estimated enrollment will be 20 undergraduate students and 20 graduate students per semester.
  c) The addition of this course is not expected to significantly affect the offering of other courses because of increases in faculty size in response to enrollment increases.
  d) The course is not expected to significantly change the enrollment of other courses.
  e) This course will be added to the undergraduate and the graduate MSIT concentrations.

4. Resources Required to Support Proposal

1. Personnel

   Faculty qualified to teach this course include Mohamed Shehab, Bill Chu, David Wilson, and Anita Raja.

2. Physical Facility

   No new capabilities are required.

3. Equipment and Supplies

   No new capabilities are required.

4. Computer

   No new capabilities are required.

5. Audio-Visual

   Current facilities are adequate to support this course.

6. Other Resources

   None identified.

5. Consultation with the Library and Other Departments or Units

1. Library Consultation

   Consultation was initiated on 12-08-2010 and completed on 12-09-2010.

2. Consultation with Other Departments or Units

   This course is not expected to overlap with other graduate courses on campus. Consultation with the following Departments has been initiated: Department of Computer Science on 12-08-2010 and the Department of Bioinformatics and Genomics on 12-08-2010.

6. Initiation and Consideration of the Proposal

1. Originating Unit

   Approved by the Department of Software and Information Systems on 11-23-2010. Approved by the College of Computing and Informatics on 3-15-2011.

2. Other Considering Units

   Approved by the Graduate Committee of the Department of Computer Science on 2/7/2011 and by the Undergraduate Committee on 2/8/2011.
   Approved by the Department of Bioinformatics and Genomics on 12/11/2010.

3. Counsel on General Education (COGE)

   This proposal was not submitted to the COGE.

7. Attachments

1. **Course Number and Title:** ITIS/ITCS 4180/5180 Mobile Application Development

2. **Catalog Description:** Mobile platforms are at the center of attention of users and organizations nowadays. Most organizations and businesses are rapidly migrating toward the cloud and need to provide a fast and easy mechanism for users to stay connected to their services. Mobile applications are the top trend nowadays given the high variety of new mobile devices and platforms such as Apple's iOS and Google's Android. In this course, students will be introduced to the foundations of mobile development and its unique requirements and constraints. Students will design and build a variety of mobile applications with a hands-on and project-based approach.

3. **Prerequisites:** Undergraduate students ITCS 2214 is required, or permission of the department. Graduate students require full graduate standing or permission of the department.

4. **Course objectives**
   - To introduce students to mobile application development environments.

- To familiarize students with the various design and implementation decisions tied to the nature of mobile application development.
- To provide students with hands-on experience by developing real world-like applications and testing them on real devices.

5. **Instruction Method**
   - Lectures / guest lectures
   - In-class activities and discussions
   - Individual and group and projects
   - Student demonstrations and presentations
   - Students in the 5180 version of the course will be required to perform additional readings and a presentation on an in-depth topic.

6. **Means of student evaluation** Student evaluation will be based upon the following:
   - Course midterm and final examinations
   - Individual and group projects

7. **University Policy**:
   - The course upholds all university academic integrity policies. Under no circumstances should a student present other people's work as his/her own.
   - Class attendance is mandatory, unless a student obtains written permission from the instructor.
   - Students will be assigned grades of A, B, C, or U, (for undergraduate students D and F grades will be included).

8. **Suggested Text(s)**

- Hello, Android: Introducing Google's Mobile Development Platform, Ed Burnette. http://www.amazon.com/Hello-Android-Introducing-Development-Programmers/dp/1934356565/
- iPhone Programming : The Big Nerd Ranch Guide, Joe Conway and Aaron Hillegass. http://www.amazon.com/iPhone-Programming-Ranch-Guide-Guides/dp/0321706242

9. **Topical Outline**:

   I.   Mobile Application Development Overview
        A. Mobile Applications, from Web-based to Native.
        B. Influence of Mobile Platforms
        C. Why Mobile Applications?
        D. Development Options

   II. Introduction to Software as a Service and APIs
        A. Service-Oriented Computing Examples.
        B. Application Programming Interfaces (APIs)
        C. APIs and Mobile Applications

III.   Mobile Application Development Design Principles
    A. Mobile vs. Desktop Environments
    B. Performance and Usability
    C. User Interface Principles and Gesture Interfaces
    D. Server and Client Side Support
    E. Security Principles and Architectures for Mobile Applications.

IV. Google Android Platform
    A. Google Application Architecture
    B. Security Model in Android
    C. Event-based Programming
    D. Eclipse Simulator

V. Apple iOS Platform (iPhone, iPad and iPod Touch)
    A. iOS Architecture
    B. UIKit Components and Usability
    C. iOS and Persistence Modals (SQlite, CoreData)
    D. Best Practices in iOS.
    E. Apple's App Store, a Business Perspective.

J. Murrey Atkins Library

Consultation on Library Holdings

To: Bruce Long
          Assistant Chair & Director of Undergraduate Programs
          Software and Information Systems Department
          College of Computing and Informatics

From: Reese Manceaux

Date: December 9, 2010

Subject: **ITIS 4190/ITIS 5180 – Mobile Application Development**

Summary of Librarian's Evaluation of Holdings:

Evaluator: Reese A. Manceaux

Check One: Holdings are superior
          ☑   **Holdings are adequate (Please see comments)   YES**
          Holdings are adequate only if Dept. purchases additional items.
          Holdings are inadequate

Comments:
          This is a proposal for an new graduate course. This course introduces
          development of mobile applications. They are the top trend given the high
          variety of devices and platforms such as Apple's iOS and Google's Android.
          Students will design and build a variety of mobile applications with a hands-on
          and project-based approach.

          A small sampling of subject searching in the Atkins Library online catalog
          reveals the following holdings in support of these courses. (See the table that
          follows). A search of the related subjects retrieved over 11,000 pertinent items.

          The Library has electronic access to periodicals and other electronic resources
          (e-books from Skillport/Books 24x7) that support these courses. Skillport, in
          particular, has an enormous catalog of computer related literature; especially up-
          to-date programming language books. In addition, the library has many
          electronic databases such as EBSCO databases (Cinahl), Springer Link, ACM
          Digital Library, IEEE Explore, ScienceDirect and Compendex (many with links
          to full text articles) supporting the overall Computing and Informatics program.
          The collection, especially if supported by ongoing purchases, is quite adequate
          to support this program.

Atkins Library Holdings in Areas Related to

Mobile Application Development

Library of Congress Subject Headings	Books	After Year 2001	Journals	Skillport /Books 24x7
Mobile Communication Systems	323	164	25	1177
Wireless Communications Systems	643	466	27	1309
Macintosh (Computer)/Apple Computer	119	47	11	1920
Cell Phone Systems	86	26	2	2242
Google	35	33		1467
Mobile Computing	104	66	11	1395
Handheld Devices				1623
TOTAL	**1310**	**802**	**76**	**11133**

Reese A. Manceaux

Evaluator's Signature

December 9, 2010