COURSE OUTLINE

Course Number
IST 108

Course Title
Introduction to Programming with Mobile Application Development

Credits
4

Lecture hours
3

Laboratory hours
2

Pre-requisite:
MAT 037 (or MAT 037A and 037B) or proficiency in basic algebra

Implementation
Spring 2015

Catalog description:
Introduces computing and programming concepts, and explores mobile and web technologies. Topics include variables, decision-making, iteration, lists, functions, decomposition, event-driven programming, databases, client-server computing, web services, platforms, programming languages, animation, texting, and geolocation. Students learn by creating Android mobile applications using App Inventor, a visual programming language.

Is course New, Revised, or Modified? Revised

Required texts/other materials:
Title: App Inventor 2
By David Wolber, Hal Abelson, Ellen Spertus, Liz Looney
Publisher: O'Reilly Media
Release Date: October 2014
Pages: 360

Revision date: N/A

Course coordinator: Meimei Gao, X3483, gaom@mccc.edu

Information resources:
Textbook
App Inventor web site (http://appinventor.mit.edu)

Other learning resources: Angle Learning Systems
Course Goals:

The student will be able to:
1. Describe mobile platforms and development environments. (GE Goal 4, MCCC CS Goals D and E)
2. Design algorithms and develop solutions using basic programming skills including sequence, selection, iteration, functions and collections. (GE Goal 4, MCCC CS Goal B)
3. Understand the concepts of user interface and event-driven programming. (GE Goal 4, MCCC CS Goal B)
4. Build mobile applications using a visual programming language. (GE Goal 4, MCCC CS Goal B)
5. Test and deploy mobile applications to mobile devices. (GE Goal 4, MCCC CS Goals D and E)

Course-specific General Education Knowledge Goals and Core Skills.

General Education Knowledge Goals
Goal 4. Technology. Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals.

MCCC Core Skills
Goal B. Critical Thinking and Problem-solving. Students will use critical thinking and problem solving skills in analyzing information.
Goal D. Information Literacy. Students will recognize when information is needed and have the knowledge and skills to locate, evaluate, and effectively use information for college level work.
Goal E. Computer Literacy. Students will use computers to access, analyze or present information, solve problems, and communicate with others.

Units of study in detail.

Unit I  Overview of mobile platforms and development environments
Learning Objectives
The student will be able to...
• describe the current mobile market. [CG1]
• explain the differences among mobile platforms and applications. [CG1]
• describe the different development environments. [CG1]

Unit II  Getting started with the first mobile application development
Learning Objectives
The student will be able to...
• use App Inventor environment to build, test and deploy a simple mobile application. [CG4&5]
• explain the concepts of user interface and event-driven programming. [CG3]

Unit III  Properties of components, Variables
Learning Objectives
The student will be able to...
• explain the concepts of properties and variables. [CG2, 3&4]
• use and change properties of components. [CG2, 3&4]
• define and use variables. [CG2&4]

Unit IV  Creating animation applications
Learning Objectives
The student will be able to...
• describe canvas coordinate system. [CG3]
• create animation applications with Clock.Timer event. [CG2, 3&4]
Unit V    Conditionals/Selections

**Learning Objectives**

*The student will be able to…*

- evaluate Boolean expressions and use Boolean operators. [CG2&4]
- use `if` and `if-else` statements. [CG2&4]
- use nested `if-else` statements. [CG2&4]

Unit VI    Repetitions/Iterations

**Learning Objectives**

*The student will be able to…*

- describe the difference between selections and iterations. [CG2&4]
- use `foreach` statements. [CG2&4]
- use `while` statements. [CG2&4]

Unit VII    Lists

**Learning Objectives**

*The student will be able to…*

- create list variables and make a list. [CG2&4]
- use indexes to select the items from a list and to traverse a list. [CG2&4]
- add an item to a list and remove an item from a list. [CG2&4]

Unit VIII    Procedures/Functions

**Learning Objectives**

*The student will be able to…*

- use built-in functions. [CG2&4]
- create their own functions. [CG2&4]
- understand the difference between the definition of a function and the call of a function. [CG2&4]
- use parameters in functions. [CG2&4]

Unit IX    Databases – TinyDB and TinyWebDB

**Learning Objectives**

*The student will be able to…*

- explain when TinyDB and TinyWebDb should be used. [CG2, 3&4]
- use TinyDB and TinyWebDB to store and retrieve data. [CG2, 3&4]

Unit X    Reading and Responding to Sensors

**Learning Objectives**

*The student will be able to…*

- use LocationSensor component to create location-aware applications. [CG2, 3&4]
- use OrientationSensor component in the applications where user can control the actions by tilting the device. [CG2, 3&4]
- use AccelerometerSensor. Shaking event to trigger actions. [CG2, 3&4]

Unit XI    Web APIs

**Learning Objectives**

*The student will be able to…*

- use web service APIs in App Inventor to retrieve data from web services. [CG2, 3&4]

**Evaluation of student learning:**

Achievement of the course objectives can be evaluated through the use of the following tools:

- Labs and homework assessing students’ problem solving ability and programming skills. (CG2, 3, 4 & 5)
- Tests assessing students’ comprehension of programming environments and concepts. (CG1, 2, 3 & 4)
- A term project to assess the students’ ability to solve a relatively complex problems using formal programming language. (CG2, 3, 4 & 5)
Specific methods for evaluating student progress through the course are up to the discretion of the instructor. Below is an example of grade breakdown:

<table>
<thead>
<tr>
<th>The final grade is based on the following values:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Tests</td>
<td>30%</td>
</tr>
<tr>
<td>Laboratory &amp; Project Assignments</td>
<td>30%</td>
</tr>
<tr>
<td>A Term Project</td>
<td>15%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Academic Integrity Statement:**

As per the student handbook, “A student will be guilty of violating academic integrity if he/she (a) knowingly represents the work of others as his/her own, (b) uses or obtains unauthorized assistance in the execution of academic work, or (c) gives fraudulent assistance to another student.” Students should read the Academic Integrity policy in the MCCC Rights and Responsibilities Student Handbook. *Academic Dishonesty will result in failure of this course.*