

Enon STEM Initiative

Mobile Development Workshop for Instructors

Instructor:

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Location: 1225 N. 12th Street, Room 327, Philadelphia PA, 19144

Course Texts:

Java: Think Java - Allen B. Downey, Chris Mayfield

<http://greenteapress.com/wp/think-java/>

Android: Android Development Guide

<https://developer.android.com/guide/index.html>

Topics

- Programming semantics
- The relationship between hardware, software, compilers and programming languages
- Introduction to Object Oriented Programming
- Control flow
- Translating problem descriptions to computer programs
- Writing imperative computer programs
- GUI and event driven development
- Mobile computing and Android

- Application Code and Presentation - Activities and Layouts
- The Android Intent system
- External resources and services
- Accessing local (file) and remote (web) content

Schedule

Session	Contents
Day 1 Morning	<ul style="list-style-type: none"> - Hello world – Introduction to the basics of OOP and Java - Data, variables and basic statements - Basic classes, objects and methods - Creating and calling methods <ul style="list-style-type: none"> - Method argument and return values - Void methods <p>Discussion:</p> <ul style="list-style-type: none"> - Understanding the DRY concept <p>Project(s):</p> <ul style="list-style-type: none"> - Calculating the area of geometric shapes <p>Reading assignment(s):</p> <ul style="list-style-type: none"> - 1.1 – 1.7, 1.9, 2.1 – 2.6
12:30 PM	Lunch
Day 1 Afternoon	<ul style="list-style-type: none"> - Revisiting Boolean values and expressions - Control flow <ul style="list-style-type: none"> - Conditional statements - Loops <p>Discussion:</p> <ul style="list-style-type: none"> - Non-linear control flow <p>Project(s):</p> <ul style="list-style-type: none"> - Tire inflation <ul style="list-style-type: none"> o Determine whether a provided air pressure value is overinflated, under inflated, or has proper inflation - Retirement gift <ul style="list-style-type: none"> o Determine the proper gift to be received by a retiring employee - Course grade statistics <ul style="list-style-type: none"> o Calculate the highest, lowest, and average grade for all students of a course

	<p>Reading assignment(s):</p> <ul style="list-style-type: none"> - 5.1 – 5.5
<p>Day 2 Morning</p>	<ul style="list-style-type: none"> - Control flow cont. <ul style="list-style-type: none"> - Types of loops - Graphical User Interface <ul style="list-style-type: none"> - Calculating the area of shapes using GUI input tools - Creating GUI applications - Using widgets for input and output (display) - Events, sources, and listeners <p>Discussion:</p> <ul style="list-style-type: none"> - Why is GUI important? - What do various components communicate to the user? - How does event driven development differ from standard development? <p>Project(s)</p> <ul style="list-style-type: none"> - Slot machine - Calculating the area of shapes using GUI input tools - Slot machine 2 (Event driven version) <p>Reading assignment(s):</p> <ul style="list-style-type: none"> - 7.1 – 7.6
12:30 PM	Lunch
<p>Day 2 Afternoon</p>	<ul style="list-style-type: none"> - An introduction to mobile computing and Android <ul style="list-style-type: none"> - Why are mobile applications important? - The Android IDE <ul style="list-style-type: none"> - Overview of Android Studio and its components - Setting up an explaining an emulator - Android Debug Bridge (ADB) - Dalvik Debug Monitor Service (DDMS) - Layouts and Views <ul style="list-style-type: none"> - The visual elements of an Android application - How certain views communicate actions and how they should be presented - View binding in activities – generating events

	<p>Project(s):</p> <ul style="list-style-type: none"> - Emulator setup - Hello, everyone - Device setup <p>Reading assignment(s):</p> <ul style="list-style-type: none"> - https://developer.android.com/training/basics/firstapp/index.html - https://en.wikipedia.org/wiki/XML - https://developer.android.com/studio/profile/ddms.html <p>https://developer.android.com/studio/command-line/adb.html</p>
Day 3 Morning	<ul style="list-style-type: none"> - Activities and Lifecycles <ul style="list-style-type: none"> - View binding revisited – setting content layout and binding to views - Manipulate view properties from code - Debugging Android applications <ul style="list-style-type: none"> - Find and fix basic bugs using IDE debugger - Android Manifest <ul style="list-style-type: none"> - Component declaration - Permissions - Android Intents and Context <ul style="list-style-type: none"> - Inter-component messaging - Launching other activities <p>Discussion:</p> <ul style="list-style-type: none"> - Android uses the Java programming language <p>Project(s):</p> <ul style="list-style-type: none"> - Magnifier (An app to show larger text for reading) <p>Reading assignment(s):</p> <p>https://developer.android.com/guide/components/activities.html</p>
12:30 PM	Lunch
Day 3 Afternoon	<ul style="list-style-type: none"> - Android Intent system <ul style="list-style-type: none"> - Function delegation - Getting data from the internet <ul style="list-style-type: none"> - Threads and Handlers <p>Project(s):</p>

	<ul style="list-style-type: none"> - Simple browser (An app to display web pages) <p>Reading assignment(s): https://developer.android.com/guide/components/processes-and-threads.html</p>
Day 4 Morning	<ul style="list-style-type: none"> - Location services <ul style="list-style-type: none"> - Global Positioning System - Location Manager <p>Discussion:</p> <ul style="list-style-type: none"> - Android services <p>Project(s):</p> <ul style="list-style-type: none"> - Photo Tagger (A photo gallery with the location where each photo was taken) <p>Reading assignment(s): https://developer.android.com/training/location/receive-location-updates.html</p>
12:30 PM	Lunch
Day 4 Afternoon	<ul style="list-style-type: none"> - Maps <ul style="list-style-type: none"> - OSMDroid Library - Using MapViews - File system and access rights <p>Project(s):</p> <ul style="list-style-type: none"> - Parker (An app to save your parking location) <p>Reading assignments: https://github.com/osmdroid/osmdroid/wiki/How-to-use-the-osmdroid-library</p>

Prerequisites and Expectations

- Ideal participants will have a background in information technology, computer science, mathematics, or other STEM related field
- Participants must have access to a computer between workshop sessions on which they are allowed to install software
- Participants must be present and on time for each session

- Participants must undertake readings and exercises assigned for completion between sessions