**Enon STEM Initiative**

**Android Development Workshop for Students**

**Instructor:**

TBD

**Assistant:**

 TBD

**Description**

Mobile devices are the computers that we carry with us at all times. Our mobile device becomes our news station, our compass map, our camera, and our conduit to the rest of the world. However, we use this computer in different ways than we use any other computer. Our interaction with it is frequent, frequently interrupted, and frequently taken for granted. This program will introduce students to application development for mobile devices. Students will learn about the various constraints inherent to Android applications as well as the new opportunities that they present. Students will learn how to address challenges in hardware and user interfaces by incorporating software design and user-interaction design principles.

**Objectives**

Introduce students to the mobile application development paradigm via innovative problem solving, entrepreneurial projects. The course will focus on implementing applications on mobile devices. Participants will become exposed to the Android development platform, and mobile application development generally though mobile design principles.

**TOPICS**

* 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**

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| **Session** | **Contents** |
| 1 | - **What is Android** - Description of mobile applications generally and Android specifically - Discussion on Open Source software- **The Android IDE** - Overview of Android Studio and its components - Project explorer - Lint - Setting up an explaining an emulator - Using ADB and DDMS- **Layouts and Views** - The visual elements of an Android application  - View binding in activities - Generating eventsProject(s):* Emulator setup
* Hello, everyone
* Development device setup
* Running applications on real devices
* Manipulating view properties of Hello, everyone
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| 2 | - **Layouts** - What is a layout? (Relationship of views to layouts) - Types of layouts and uses - Linear layout - Relative layout - Frame layout - Table layout - Layout properties - Nested layouts - Scroll View- **Testing layouts** - Viewing layouts on different devices on IDEDiscussion:* Extensible Markup Language (XML)

Project(s):* **Create a registration form** (Use appropriate layout to create a signup form for a service) (Worksheet 2 without logic)
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| 3 | - **More interesting applications** - Android Activities in detail - Using onCreate() - The Activity Lifecycle - View binding revisited – setting content layout and binding to viewsDiscussion:* Android uses the Java programming language

Project(s):* **Collect and print registration information** (Collect entered information and print it to the LogCat) (Worksheet 2)
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| 3 | - **More interesting applications** - Manipulate view properties from code - Creating views in code and adding them to layouts- **Debugging Android applications** - Find and fix basic bugs using IDE debugger- **Android Intents and Context** - Creating and launching other activitiesDiscussion:* Intents for message passing
* Creating applications with multiple activities (each activity should have a single job)

Project(s):* **Text Passing** (An app to pass text information from one activity to another)
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| 4 | - **Android Intents and Context** - Creating and launching other activitiesDiscussion:* Context sources and purpose

Project(s):**Magnifier** (An app to show larger text for reading) |
| 5 | - **Getting data from the internet** - The internet permission - The WebView componentDiscussion:* URLs, the internet, and HTML

Project(s):* **Simple browser** (An app to display web pages)
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| 6 | - **Working with Files** - Reading and writing data to storage - Accessing files across applications - Private and public storage - Shared PreferencesDiscussion:* Android applications and memory
* File system permissions
	+ Read and write permissions
	+ File access

Project(s):* **Notepad** (Store entered information for later retrieval)
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| 7 | - **Saving data** - Shared PreferencesDiscussion:* Android applications and memory
* File system permissions
	+ Read and write permissions
	+ File access

Project(s):**URL saver** (Update browser app to automatically load last saved URL using Shared Preferences) |
| 8 | - **Working with Images** - Getting images from the cameraDiscussion:* Requesting fewer permissions by using Intents
* Accessing images on file system

Project(s):**Image Displayer** (take pictures using the camera and display them on the main activity) |
| 9 | - **Location services** - Global Positioning System - Location ManagerDiscussion:* Android services

Project(s):**Get GeoLocation** (Connect to the location service and get user coordinated) |
| 10 | Project(s):**Photo Tagger** (A photo gallery with the location where each photo was taken) |

**Prerequisites and Expectations**

* None