**Enon STEM Initiative**

**Java Programming Workshop for Students**

**Instructor:**

TBD

**Assistant:**

 TBD

**Description**

Introduction to computer programming and object-oriented development using the Java programming language. Topics covered include managing data in a computer program, data types, classes, and object, controlling program flow and writing applications incorporating a Graphical User Interface.

**Objectives**

Introduce students to the concepts behind developing computer programs. Show how programs interact with the underlying computer hardware to solve real world problems. Show how a program progresses to solve problems and how to manipulate that progression.

**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

**Schedule**

|  |  |
| --- | --- |
| **Session** | **Contents** |
| 1 | - **Hello world – Introduction to the basics of OOP and Java**- **Data, variables and basic statements**Project(s): * **Calculating the area of geometric shapes**
 |
| 2 | - **Basic classes, objects and methods**- **Creating and calling methods**- Method argument and return values- Void methodsProject(s):* **Shape Area 2.0 (Calculate the areas for additional shapes)**
 |
| 3 | - **Revisiting Boolean values and expressions**- **Control flow** - Conditional statementsDiscussion:* Non-linear control flow

Project(s)* **Retirement gift**
 |
| 4 | **Revisiting Boolean values and expressions**- **Control flow cont.** - Loops - Types of loops - For, While, Do-While - Purpose of various loop typesDiscussion:* Why looping is important
* Identifying appropriate places for loops
* Loop errors
	+ Infinite loops
	+ Off-by-one error

Project(s)* **Blast Off**
* **Slot machine**
 |
| 5 | - **Graphical User Interface** - Calculating the area of shapes using GUI input tools - Creating GUI applicationsDiscussion:* Why is GUI important?
* What do various components communicate to the user?

Project(s)* **Calculating the area of shapes using GUI input tools**
 |
| 6 | - **Graphical User Interface** - Using widgets for input and output (display) - Events, sources, and listenersDiscussion:* How does event driven development differ from standard development?

Project(s)* **Slot machine 2 (Event driven version)**
 |

**Prerequisites and Expectations**

* None