This course introduces core computer programming and database principles that are needed for web application development. Students are expected to complete several hands-on and portfolio projects and attend in class lectures, exam preparation, assessment and feedback sessions.

This course will be 12 weeks, conducted 8 hours per day (to clarify, the course is 6 hours per day. The extra 2 hours is for studying, working on their projects and tutoring. Tutoring would be conducted by York College C.S. student volunteers if/when available). 5 days per week (1 week introduction, 10 weeks of instruction, and 1 week of exam review/internship interviews preparation)

Tentative Course Start Date: Monday, February 6th, 2017

Tentative Course End Date: Friday, May 12th, 2017

Expected Instructional Duration: 50 days (10 weeks \* 5days/wk, which excludes holidays and Spring Recess)

Course Objectives

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During the course, the students will:

1. Learn The Basics of How The World Wide Web Websites, and The Internet Work
2. Learn How to Build Static Websites using HTML5 and CSS3
3. Learn JavaScript for Web Developers
4. Learn The Basics of the JQuery library, written in Javascript
5. Learn How to Build Interactive Websites using HTML5, CSS3, Javascript, and JQuery
6. Learn the Fundamentals of the Java Programming Language
7. Learn the Fundamentals of Storing and Retrieving Data using Relational Databases and SQL
8. Learn How to Build Websites That Can Create, Read, Update, and Delete Data using HTML5, CSS3, Javascript, JQuery, Java and an Oracle SQL database
9. Learn How to Deploy Websites That They've Built So That They are Accessible to Everyone with an Internet Connection
10. Students will also do a deep dive into Oracle SQL as preparation to take the Oracle SQL Fundamentals Exam (1Z0-061) after completion of the course.
11. The (positive) results of the SQL Fundamentals exam would be a “work product” for students’ portfolios. The primary objective is for students to prepare for, take and pass the Java 7 Programmer Certification.

Course Outline

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1. **Learn The Basics of The World Wide Web, Websites, and The Internet**

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Week 1

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The Internet and The World Wide Web: What is the difference?

Duration: 1/4 day

1. **Learn How to Build Static Websites using HTML and CSS**

(4 3/4 days total)

Learn the Difference Between Static and Interactive Websites

Discuss Examples of Both Static and Interactive Websites Present on the World Wide Web

Duration: 1/4 day

Learn HTML - The Backbone of all Websites

Duration: 1 1/2 days

Make Your HTML-Only Website Look Nice(r) with CSS

Duration: 3 days

Week 2-3

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1. **Learn How to Build Interactive Websites using HTML, CSS, Javascript, and JQuery (7 days total)**

Learn How JavaScript Makes Your HTML and CSS-only Website Respond to User Actions

Duration: 1/4 days

What is The Document Object Model (DOM)?

Duration: 1/4 days

Learn To Use Javascript to Interact with the DOM and the HTML and CSS Code in Your Website

Duration: 3 1/2 days

**4. What is JQuery?**

Why Use JQuery Instead of Plain Javascript When Accessing the DOM?

Duration: 1/4 day

Learn How to Build Interactive Websites using HTML, CSS, Javascript, and JQuery

Duration: 2 days

JQuery vs Javascript Website Showdown: Do Different Browsers Behave Differently?

Duration: 1/2 day

Beyond JQuery: Other Javascript Libraries and Frameworks Used for Building Interactive Websites

Duration: 1/4 day

Weeks 3-7

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**7. Learn How to Build Websites That Can Create, Read, Update, and Delete Data using HTML, CSS, Javascript, JQuery, Java and an Oracle SQL database**

Duration (23 days total)

1. **How does Java Let Me Add Logic To My Website?**

Programming Java using the Eclipse IDE (Integrated Development Environment)

Duration: 1/2 days

Fundamentals of the Java Programming Language

Define the scope of variables in Java Programs

Define the structure of a Java class

Create executable Java applications

How To Run Java Programs from the Command Line

Using Object Orientation in Java

Working with Java Data Types

Creating and Using Arrays

Operators, Loops, and Decision Constructs

Constructors, Methods and Encapsulation

Inheritance in Java

Poymorphism, Abstract classes and Interfaces

Handling Exceptions

Working with the Java API

Duration: 15 1/2 days

**9. Learn How to Deploy Websites You've Built So That They are Accessible to Everyone with an** Internet Connection

Introduction to the Play Framework

Deploying Websites using Java and the Play Framework

Duration: 2 days

1. **What is a Relational Database?**

What Types of Problems Do Relational Databases Solve?

How Do We Design A Relational Database?

Duration: 1 day

SQL: The Programming Language of Relational Databases

Using SQL to Query Relational Databases and Create, Read, Update, and Delete User Data

Duration: 2 days

Using HTML, CSS, Javascript, JQuery, Java and an Oracle SQL database to Create, Read, Update, and Delete User Data via Websites

Duration: 2 days

Weeks 8-10

Prepare for the Oracle SQL Fundamentals Exam (1Z0-061) after completion of the course.

Overview of Oracle Database 12c and Related Products

Overview of relational database management concepts and terminologies

Introduction

• Data vs. information

• History of the database

• Major transformations in computing

What is Data Modeling?

• Conceptual & physical models

• Entities, instances, attributes and identifiers

• Entity relationship modeling and ERDs

Entity Relationship Diagramming

• Identifying relationships

• ER diagramming conventions

• Speaking ERD and drawing relationships

Identify the major structural components of the Oracle Database 12c

Create tables to store data

Truncate data

Insert rows into a table

Update rows in a table

Delete rows from a table

Create reports of aggregated data

Build a SELECT statement to retrieve data from an Oracle Database table

Restricting and Sorting Data

Using the WHERE Clause

• Working with columns, characters, and rows

• Limit rows selected

• Comparison operators

Use the ORDER BY clause to sort SQL query results

Limit the rows that are retrieved by a query

Use ampersand substitution to restrict and sort output at runtime

Use SQL row limiting clause

Using Single-Row Functions to Customize Output

Use various types of functions available in SQL

Retrieve row and column data from tables

Build a database schema

Utilize views to display data

Manage schema objects

Write multiple-column sub-queries

Display data from multiple tables

Employ SQL functions to retrieve customized data

Create reports of sorted and restricted data

Introduction to JOINS

Natural join

Self-join

Non equi-joins

OUTER join

Duration (15 days total)