

Syllabus

Virginia Programming Semester A

Course Overview

This one-semester course is intended as a practical, hands-on guide to help you understand the concepts involved in computer programming. This course has 15 lessons organized into four units, plus four Unit Activities. Each lesson contains one or more Lesson Activities.

Additionally, there is one Course Activity that you need to work on throughout the duration of the course. The activity is a long-term project spread over the length of the course. The due date for the activity is to be determined by the course instructor.

This course describes the skills and training required for careers in computer programming and the work ethics required in a computing environment. This course covers the use of enterprise systems and discusses number systems, data types, and functions used in computation. In addition, this course discusses computer programming, including programming languages, types of programming paradigms, and program structures. Finally, this course also covers web programming, teaching you how to create web pages in HTML, how to use program structures in JavaScript, and how to do programming with JavaScript.

You will submit the Unit Activity documents to your teacher, and you will grade your work on the Lesson Activities by comparing them with the given sample responses. The Unit Activities (submitted to the teacher) and the Lesson Activities (self-checked) are the major components of this course. There are other assessment components, namely the mastery test questions that feature along with the lesson; the pre- and post-test questions that come at the beginning and end of the unit respectively; and an end-of-semester test. All of these tests are a combination of simple multiple-choice questions and technology-enhanced (TE) questions.

Course Goals

This course will help you meet the following goals:

- Familiarize yourself with career options in computer programming.
- Explore the use of enterprise systems for business solutions.
- Discuss the ethics and responsibilities of a computer programmer.
- Familiarize yourself with number systems used for data representation.
- Explore the data types used for computer programming.
- Describe the mathematical and statistical functions and logic used in computation.
- Explore how a computer executes a program.
- Explore different programming languages available to solve problems and develop systems.
- Apply procedural programming to solve a problem.
- Explore the concepts of object-oriented programming.
- Create program structures to implement algorithms.

- Use basic HTML commands to create and structure a web page.
- Enhance web pages.
- Familiarize yourself with the basic features of JavaScript.
- Create and validate forms using JavaScript.

Prerequisite Skills

Virginia Programming Semester A has a prerequisite course, Information Technology (IT) Fundamentals. Also, these fundamental skills will be helpful:

- basic math knowledge
- ability to visualize and apply creativity and innovation
- familiarity with the writing process and following guidelines

General Skills

To participate in this course, you should be able to do the following:

- Perform basic operations on a computer.
- Perform online research using various search engines and library databases.
- Communicate through email and participate in discussion boards.

For a complete list of the general skills required for participation in online courses, refer to the Prerequisites section of the Plato Student Orientation document, found at the beginning of this course.

Credit Value

Virginia Programming Semester A is a 0.5-credit course.

Course Materials

- notebook
- computer with Internet connection and speakers or headphones
- Microsoft Word or equivalent
- Microsoft Excel or equivalent
- Microsoft PowerPoint or equivalent
- scanner
- printer

Course Pacing Guide

This course description and pacing guide is intended to help you stay on schedule with your work. Note that your course instructor may modify the schedule to meet the specific needs of your class. Also, the course instructor will determine the due date for the Course Activity, which is a long-term project over the length of the course.

Unit 1: Careers and Responsibilities in Programming

Summary

In this unit, you will learn about the career options in computer programming. You will also explore the effect of enterprise systems on businesses and the tools used in enterprise systems. Additionally, in this unit, you will learn about business ethics, compare ethical and unethical business practices, and learn about copyright and licensing in the software industry.

Day	Activity/Objective	Type
1 day: 1	Syllabus and Plato Student Orientation <i>Review the Plato Student Orientation and Course Syllabus at the beginning of this course.</i>	Course Orientation
Extended Project	Joining a Student Organization	Course Activity
3 days: 2–4	Careers in Computer Programming <i>Explore career options in computer programming.</i>	Lesson
4 days: 5–8	Enterprise Systems <i>Describe the use of enterprise systems for business solutions.</i>	Lesson
1 day: 9	Para Jumble	Game
4 days: 10–13	Work Ethics in a Computing Environment <i>Discuss the ethics and responsibilities of a computer programmer.</i>	Lesson
5 days: 14–18	Unit Activity/Threaded Discussion—Unit 1	Unit Activity
1 day: 19	Post-test—Unit 1	Assessment

Unit 2: Data Representation and Execution

Summary

In this unit, you will study the number systems and the conversions between the number systems. You will learn about various data types, and the way data is stored in the computer's memory. You will also learn about basic arithmetic and logical operations. In the last lesson of this unit, you will learn about the program execution process.

Day	Activity/Objective	Type
4 days: 20–23	Number Systems <i>Explore number systems used for data representation.</i>	Lesson
4 days: 24–27	Data Types <i>Explore the data types used for computer programming.</i>	Lesson
1 day: 28	Space Jumble	Game
3 days: 29–31	Operators: Arithmetic, Relational, and Logical <i>Describe the mathematical and statistical functions and logic used in computation.</i>	Lesson
4 days: 32–35	Program Execution <i>Analyze how a computer executes a program.</i>	Lesson
5 days: 36–40	Unit Activity/Threaded Discussion—Unit 2	Unit Activity
1 day: 41	Post-test—Unit 2	Assessment

Unit 3: Computer Programming

Summary

In this unit, you will explore programming languages and identify the programming language suitable to solve a problem. You will learn about algorithms and use procedural programming to solve a problem. In addition, you will familiarize yourself with concepts of object-oriented programming. Finally, you will identify iterative and noniterative program structures.

Day	Activity/Objective	Type
4 days: 42–45	Programming Languages <i>Describe different programming languages available to solve problems and develop systems.</i>	Lesson
4 days: 46–49	Procedural Programming <i>Explain procedural programming.</i>	Lesson
1 day: 50	Para Jumble	Game
4 days: 51-54	Object-oriented Programming <i>Understand the concepts of object-oriented programming.</i>	Lesson
3 days: 55–57	Program Structures <i>Create program structures to implement algorithms.</i>	Lesson
4 days: 58–61	Unit Activity/Threaded Discussion—Unit 3	Unit Activity
1 day: 62	Post-test—Unit 3	Assessment

Unit 4: Web Programming

Summary

In this unit, you will learn HTML commands to create a web page, and learn how to add different elements to enhance web pages. You will familiarize yourself with features of JavaScript and create a basic JavaScript. Finally, you will create and validate forms in JavaScript.

Day	Activity/Objective	Type
4 days: 63–66	Creating Web Pages in HTML <i>Apply basic HTML commands to create and structure a web page.</i>	Lesson
5 days: 67–71	Enhance Web Pages in HTML <i>Enhance Web pages.</i>	Lesson
1 day: 72	Space Jumble	Game
5 days: 73–77	Using Program Structures in JavaScript <i>Explore the basic features of JavaScript.</i>	Lesson
4 days: 78–81	Programming with JavaScript <i>Create JavaScript code for validating forms.</i>	Lesson
5 days: 82–86	Unit Activity/Threaded Discussion—Unit 4	Unit Activity
1 day: 87	Para Jumble	Game
1 day: 88	Post-test—Unit 4	Assessment
1 day: 89	Semester Review	
1 day: 90	End-of-Semester Test	Assessment