FLVS Computer Science is STEMulating

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any time, any place, any path, any pace

STEM and the Job Market
Where is STEM in the growing job market?

Florida Virtual School
Established in 1999
• Grown from 250 students to over 100,000 students.
• Grown from 4 courses to over 100 courses.
• Grown from 6 teachers to over 1000 teachers.

Computer Programming 1
• 2 semesters (16-18 wks / semester)
• Two full time instructors
• 150 students/teacher
• Prerequisite: Alg I and Geometry
• Language: Python and Java
• 20 programming projects per semester
• Project based learning
• Collaborative projects
• Modeled university programs for introduction to Computer Science

AP Computer Science A
• 2 semesters (16-18 weeks/semester)
• Two full time instructors
• 120 students per teacher
• Prerequisite: Alg I, Geo and Alg II
• Language: Java
• 40 Programs per semester
• Rigorous
• 21st Century Skills
• Covers Java subset defined by College Board course description

Computer Programming I

Segment 1
Programming Language = Python
The Scribbler robot represents a programmable manipulative for visualizing the process of algorithmic thinking.

Segment 2
Programming Language = Java
Graphics, images, and audio represent manipulative objects for experimental algorithmic thinking.

2.07 Module Project
Python
Extend the programming computing concepts learned in this module by adding new functionality to a previously written program (or write a new program).
### 3.04 Round and Round  
**Python**

Write user-defined function to create repetitive circular patterns.

![Circular Patterns](image1.png)

### 3.05 Zelle Graphics Functions  
**Python**

Use graphics functions to create a picture.

![Zelle Graphics](image2.png)

### 4.04 IR Sensor  
**Python**

Program the robot to navigate the perimeter of an enclosed space by detecting the walls.

![IR Sensor Robot](image3.png)

### 4.04 Light Seeker  
**Python**

Program the robot to move toward a bright light in its environment.

![Light Seeker Robot](image4.png)

### 7.02 Turtle Graphics Methods  
**Java**

Draw a picture with Turtle graphics methods.

![Turtle Graphics](image5.png)

### 7.03 Intro to Object Oriented Programming  
**Java**

![Object Oriented Programming](image6.png)
7.04 Iterations with for Loops

Plot survey results on a bar graph using Turtle graphics methods.

7.07 Module Project

Extend the media computing concepts learned in this module by adding new functionality to a previously written program (or write a new program).

8.01 What Condition is Your Condition In

Write a program to draw a fractal using a string of characters to define the base pattern (L-System).

8.02 Manipulating Colors

Manipulate the individual pixel colors of a digital image to produce a variety of special effects.

8.03 Copying Pixels

Stitch together individual images to form a panorama.

8.05 Logical Operators

Convert a color image to gray scale and reapply color with a user-defined palette.
Extend the media computing concepts learned in this module by adding new functionality to a previously written program (or write a new program).

Replace the background of an image using the chroma key technique.

Use Graphics2D methods to horizontally and vertically mirror individual panels into a composite picture.

Create a kaleidoscopic image by diagonal, vertical, and horizontal mirroring.

Plot the maximum daily temperature for a specific city using data retrieved directly from the National Weather Service web site.

Extend the media computing concepts learned in this module by adding new functionality to a previously written program (or write a new program).
AP Computer Science A

Segment 1
Java basics
By solving real world problems, students learn Java basics and transitions into OOP.

Segment 2
Advanced topics and application
Skills develop in more advanced topic such as recursion, inheritance, and algorithms (searching and sorting). The GridWorld Case Study is covered.

6. For the data structure, we either as an array or as an ArrangedList.
7. Create a minimum of five different objects
8. Your CO2 footprint should account for the following:
   + annual emission of gasoline used
   + annual emission of electricity used
   + annual household waste recycled
   + replacement of incandescent bulbs
The contractor should include the following parameters:
   + annual gasoline used
   + average electricity bill and average electricity price
   + number of people in house
   + recycle paper, plastic, glass, or cans (Bollus)
   + number of light bulbs replaced

Expected Output: When your program runs correctly you should see output similar to the following screen shot. (Your results show five rows of data.)

I Have A Dream

6/11/2011

I Have A Dream

FLVS AP Computer Science

2010 Results AP Computer Science

<table>
<thead>
<tr>
<th>Pass Rate</th>
<th>Nation</th>
<th>FLVS</th>
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<tr>
<td>45%</td>
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<td>99%</td>
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<td>2.47</td>
<td>3.14</td>
<td>4.54</td>
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Fred FLVS Students took the APCS Exam = 8% of Florida

30% of the 5s in Florida were made by FLVS students.
Computer Science and STEM

- Projects all related to STEM areas
- Computer Science belongs in STEM and supports all other areas
- Higher order thinking skills, problem solving, algorithmic thinking

**STEM**

**Computer Science**

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