

**Virginia Western Community College**  
**ITP 100**  
**Software Design**

**Prerequisites**

None

**Course Description**

Introduces principles and practices of software development. Includes instruction in critical thinking, problem solving skills, and essential programming logic in structured and object-oriented design using contemporary tools.

**Semester Credits: 3    Lecture Hours: 3    Lab/Clinical/Internship Hours: 0**

**Required Materials****Textbook:**

No textbook required

**Other Required Materials:**

Internet Access

Access to a computer capable of running software required for course  
Python 3.x (downloadable from the web)

**Course Outcomes**

**At the completion of this course, the student should be able to:**

- Understand the tools required to develop software. Discuss the basic function of programmed applications, hardware, etc. Be able to communicate design requirements through pseudocode and flowcharts
- Use various datatypes, and convert between datatypes
- Develop working programs. Effectively use Boolean logic, as well as if/else statements.
- Effectively write scripts that use logic / conditions, and gain a basic under of encapsulation with functions. Deal with unexpected input through permissions and validation.
- Understand how to properly use iterative tools to solve problems.
- Work with strings in programs. Be able to loop/search/find/replace strings
- Deal with files in a safe, secure manner. Validation, proper access will be used when opening, reading and writing files

- Understand data structures. Develop programs using Lists.
- Identify and use regular expressions to solve problems
- List the principals of secure programming. Show an understanding by designing programs that meet these principals.
- Describe Object Oriented Programming. Understand how objects are created and used and how encapsulation applies.

## Topical Description

1	<b>Introduction to the tools</b> Blackboard Repl.it draw.io Idle
1	<b>Introduction to Python and Programming</b> pseudocode flow charts
2	<b>Variables</b>  string, int, float type and casting
3	<b>Conditionals</b>  if, elif, else boolean logic
4	<b>Functions</b>
4	<b>Debugging and Error Handling</b> Try / Except print statements Permissions, validation, checking input
4	<b>Scripting Languages</b> What they are How they are generally used Midterm Exam Review

	<b>Midterm Exams</b>
5	<b>Iterations</b> Exam Review Project Review for while while True
6	<b>Strings</b> looping searching finding replacing
7	<b>Files</b> Handlers Open, close read()
8	<b>Lists, Data Structures</b> Populating reading, writing
9	<b>Regular Expressions</b> <b>What are they</b> When and why would we use them
9	<b>Python Security and OOP</b> Security Design in Programming Intro to OOP
15	<b>Exam and Project Review</b> MTA in Python Optional attempt
	<b>Final Exam</b>

## Notes to Instructors

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