09 Aug 2018

Subj: SY201 COURSE SYLLABUS

Course Learning Outcomes

Through this course you will be able to:

- Determine the basic programming concepts required to solve a problem through programming.
- Design, implement, debug, and document programs in Python using structured programming techniques.
- Analyze a given program specification and identify the data structures to use to implement the solution.
- Perform normal user operations from the shell in a UNIX environment
- Apply secure coding principles in order to understand the origins of cyber security vulnerabilities.

Key Themes

- Viewing the programmer as part of the security solution.
- Developing test cases to evaluate programs.
- Designing and developing programs that are modular in design.
- Developing programs consistent with the UNIX philosophy.

Course Topics

a. Programming Introduction

    - Development Environment
    - Programming Introduction Lab: Setup VM
    - Programming Introduction Lab: Shell Familiarization
    - Problem solving techniques
    - Review of security principles

b. Input, processing and output

    - Variables
    - *Programming Assignment One*
    - Basic Input/output

c. Decision structures and Boolean logic

    - Arithmetic and Logical Operators, Truth Tables
    - Conditionals
    - *Programming Assignment Two*
    - Nested Conditionals

- Nested ifs and exception handlers
- *Programming Assignment Three*

d. Repetition structures

- Loops
- Nested Loops
- *Programming Assignment Four*
- Development methodologies

e. Intermediate Input / Output

- Python – Command Line Arguments
- Python – File I/O
- Python – Sockets
- *Programming Assignment Five*
- Defensive programming

f. Basic Reusability

- Python – Functions
- Python – Objects and Methods w/ Strings
- Python – Lists
- Basic Reusability Lab: (Lists)
- Python – Dictionaries
- Recursion
- *Programming Assignment Ten*
- Python – Classes
- *Programming Assignment Six*
- *Programming Assignment Nine*
- *Programming Assignment Eleven*

g. Hashing and password management

- *Programming Assignment Seven*

h. Encryption and sensitive data management

- *Programming Assignment Eight*

i. Python modules