**GUJARAT TECHNOLOGICAL UNIVERSITY**
**BRANCH**: CYBER SECURITY (59)
**SUBJECT NAME**: Defence Programming in Python
**SUBJECT CODE**: 2725901
**SEMESTER:** II

**Type of course:** Master of Engineering (Cyber Security)

**Prerequisite:** Basic concepts of C and C++

**Rationale:** This course aims to write basic programs and high level applications using concepts such as Class, BIF of Python, functions, variables, If Else statements, For loops, While loops, iterative and recursive programs and algorithms such as the Insertion Sort algorithm. This course will be of great interest to all learners who would like to gain a thorough knowledge and understanding of the basic components of computer programming using the Python language – and might be a gentle introduction to programming for those who think they might have a longer term interest in the subject area.

**Teaching and Examination Scheme:**

| Teaching Scheme | | | Credits | Examination Marks | | | | | | Total Marks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Theory Marks | | Practical Marks | | | | |
| L | T | P | C | ESE (E) | PA (M) | ESE (V) | | PA (I) | | |
| | | | | | | ESE | OEP | PA | RP | |
| 3 | 0 | 2 | 5 | 70 | 30 | 20 | 10 | 10 | 10 | 150 |

**Content:**

| Sr. No | Content | Total Hrs | %weightage |
|---|---|---|---|
| 1 | Introduction to Python<br>• Installation of Python<br>• Basic element of python<br>• Control Structure<br>• Strings and Input<br>• Iteration<br>• Comments and pound characters | 3 | 5% |
| 2 | Functions, Scoping and Abstraction<br>• Functions and scoping<br>• Recursions<br>• Global Variables<br>• Modules<br>• Files<br>• System functions and parameters | 4 | 7% |
| 3 | Structure Types<br>• Strings | 2 | 4% |

| | | | |
|---|---|---|---|
| | • Tuples<br>• Lists<br>• Dictionaries | | |
| 4 | Testing and Debugging<br>• Types of testing<br>• Debugging<br>• Handling Exception | 2 | 2% |
| 5 | Classes and Object Oriented Programming<br>• Abstract Data Types and Classes<br>• Inheritance<br>• Encapsulation and Information Hiding | 5 | 10% |
| 6 | Networking<br>• Basics of Networking<br>• Networking and Multithreading Programming – sockets, Threads and processes, Chat Application | 5 | 7% |
| 7 | Penetration Testing<br>• Build port scanner<br>• Build SSH botnet<br>• FTP Scanner<br>• Regular Expression | 6 | 15% |
| 8 | Forensic Investigation with Python<br>• Analysis of wireless access point in the Registry<br>• Recover deleted items in recycle bin<br>• Parse PDF metadata<br>• Investigating application artifacts with python | 5 | 20% |
| 9 | Network Traffic Analysis with Python<br>• Introduction of PyGeoIP<br>• Analyse LOIC traffic<br>• Pentagon's Dilemma<br>• Intrusion Detection System using Scapy | 6 | 12% |
| 10 | Wireless mayhem with python<br>• Introduction of Wireless Security<br>• Setting of Wireless attack environment<br>• Listen wireless secret<br>• Firesheep Detection | 6 | 12% |
| 11 | Web recon with python<br>• Introduction of Social Engineering<br>• Mass Social Engineering | 4 | 6% |

**Text Books:**


1) Introduction to Computation and Programming using Python by John V. Guttag, Prentice hal
2) Core Python Programming by R. Nageswara Rao, Dreamtech Publication
3) Violent Python – A cookbook for Hackers, Forensic Analysts, Penetration Testers and Security Engineer by TJ O'Connor
4) Penetration Testing: A Hands-On Introduction to Hacking 1st Edition by Georgia Weidman

**Learning Outcome:**

- Able to apply the principles python programming.
- Write clear and effective python code.
- Create applications using python programming.
- Implementing database using SQLite.
- Access database using python programming.
- Develop web applications using python programming.
- Develop and use Web Services using python.

**List of Experiments:**

1. Study python: Python in Linux,Windows, iphone, Androids.
2. Study Python in Embedded Devices: Routers
3. Write python program to let user enter some data in string and then verify data and print welcome to user.
4. Write python program in which an function is defined and calling that function prints Hello World
5. Write python program in which an function(with single string parameter ) is defined and calling that function prints the string parameters given to function.
6. Write python program in which a class is define, then create object of that class and call simple print function define in class.
7. Write a python program for server and client.
8. Write a python program to scrap Web Applications – HTML and XML file analysis.