



Tech Foundations

With this program, you'll gain a profound understanding of how computers and the internet works. You'll become proficient in writing C and Python codes and working with command line and Git. You'll also learn to build real-world software using Object-Oriented Principles.

Programming Constructs with Instruction Flows

This course is designed for people with no programming experience. In this course, you'll learn the fundamental concepts of programming through visual representations. By the end of this course, you'll be able to approach problems in a step-by-step way and solve them like a programmer.



Variables, Datatypes and Operators

- Introduction to Variables and Datatypes
- Arithmetic Operators
- Relational Operators
- Logical Operators
- Operator Precedence

Control Flow

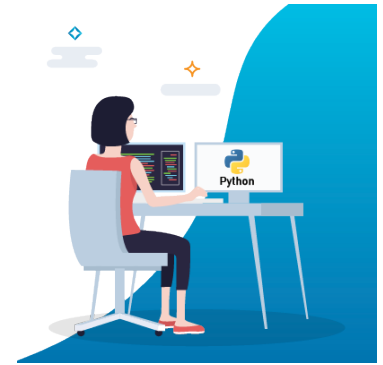
- Conditional Statements
- Nested Conditional Statements
- Loops
- Loops with Conditions
- Nested Loops
- Looping Concepts
 - Breaking out of Loops
 - Infinite Loops

Functions & Arrays

- Introduction to Functions
- Nested Function Calls
- Defining Arrays
- Accessing & Updating Array Elements
- Two Dimensional Arrays

Python & OOP Concepts

Python is one of the most versatile programming languages. In this course, you'll gain proficiency in Python and will apply it to automate a broad range of tasks. You'll also learn to build modular software with object-oriented principles.



Getting Started with Python

- Operators, Datatypes & Variables
- Lists
- Strings
- Loops
- Conditional Statements

Functions, Methods & Data Structures

- String Methods
- Tuples & Sequences
- List Methods
- Sets
- List Comprehensions
- Dictionaries

Imports, Modules & Packages

- Modules
- Packages
- Standard Library
 - Dates & Times
 - OS & File System
- Third-party Packages
 - Managing Third-party Packages
 - Accessing Internet with Requests & BeautifulSoup
 - IPython & Jupyter Notebooks

Object-Oriented Programming

- Modelling Software after Real-World Objects
- Encapsulation
- Inheritance
- Abstraction
- Polymorphism

OOP with Python

- Classes & Object in Python
- Attributes & Methods
- Errors & Exceptions
- Abstract Classes & Methods
- Magic Methods

Selected Topics in Python

- Iterators & Generators
- Local & Global Variables
- Decorators & Higher-Order Functions
- Context Managers
- Writing Clean Python Code
- Command Line Applications
- Type Hinting
- Managing Virtual Environments

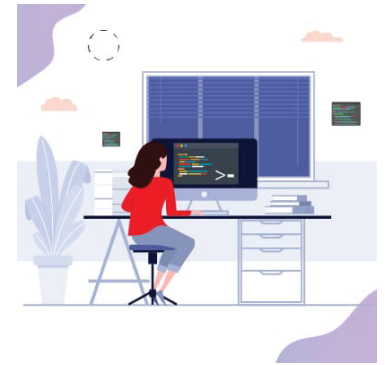


Course Project

Dragons vs
Terminators

Develop in-game characters for a Tower-Defense game in a modular and reusable way by applying Object-Oriented Principles in Python.

Working with Command-Line



Dive into the depth of Linux by mastering command line, writing bash scripts and managing remote servers. By the end of this course, you will become a power-user who can control various aspects of your computer without using a mouse.

Getting Started with Command Line

- Windows vs Linux Command Line
- Opening a Terminal
- Working with WSL in Windows
- Basic Commands in Terminal

Files & File System

- File Paths & Current Working Directory
- Moving and Manipulating Files
- Navigating the File System
- Vim and Nano Text Editors
- Hidden Files
- Searching for Files
- Creating Files and Folders
- Compressing and Decompressing Files

Linux Administration & Scripting

- Super Users and Managing Permissions
- Conditions and Loops in Bash
- Installing and Uninstalling Packages
- Globbing
- Writing and Running Bash Scripts
- Environment Variables and Profile
- Special Variables and Command-line Arguments

Networking & SSH

- Common Network Commands
- Downloading Files
- Secure Remote Shell Access
- Configuring SSH Client & Server
- SSH Tunneling
- Secure File Transfer with SFTP

Effective Command-Line

- Piping and Redirection
- Filters
- Text Processing with Grep, Sed & Awk
- Keyboard Shortcuts for efficient Command-Line Usage
- Oh My ZSH!
- Multiplexing Terminals in single screen with Tmux

Windows Command Prompt & Powershell

- Command Prompt vs Powershell
- Windows Command Prompt and Environment
- Writing Powershell Scripts
- Managing Software with Chocolatey

Course Project File Encryption App

Build a Command-Line Application to Encrypt and Decrypt Files

Fundamentals of Computer Science



This course will give you a profound understanding of how computers and the internet works. You'll understand the computer architecture, phases of compilation and the inner workings of Operating Systems. You'll also learn about the various layers in the network stack.

OS & Computer Architecture

- Understanding Phases of Compilation
- Introduction to Computer Architecture
- Process Management
 - Processes & Threads
 - Synchronization & Deadlocks
- Memory Management
 - Virtual Memory
 - Fragmentation
 - Paging
- File & Disk Management



Course Project Micro Shell

Build an application that emulates the linux shell.

Computer Networks

- Internet
 - Network of Networks
 - Network Stack
 - Application Layer
- Transport Layer
 - Network Congestion
 - UDP: User Datagram Protocol
 - TCP: Transmission Control Protocol
- Network Layer
 - IP & Forwarding
 - CIDR: Classless Inter-Domain Routing
 - DHCP
 - Data Fragmentation
 - NAT & Subnets
- Application Layer (Web)
 - HTTP & Other Protocols
 - Browsers & Servers
 - Proxy Servers
 - Sockets
- Web Servers
 - Client-Server Architecture
 - Static & Dynamic Web Servers
 - DNS Servers

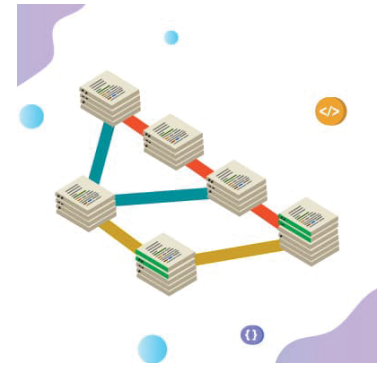


Course Project Command-Line Chat Application

Build a peer-to-peer Command-Line Chat Application that allows you to communicate with people over your local network

Collaborating with Git

Learn to maintain different versions of software with Git and collaborate on Open Source Projects



VCS & Git Repositories

- Introduction to VCS & Git
- Git and Github
- Managing Repositories on Github
- Cloning and Initializing Repos

Everyday Git

- Staging Area & Ignoring Files
- Committing Staged Files
- Writing Good Commit Messages
- Syncing with Remote Repositories
- Working with Branches
- Merging Branches
- Stashing Uncommitted Changes
- Resolving Merge Conflicts

Rewriting History

- Git Log and Graph
- Reverting Commits
- Changing Commits & Commit Messages
- Rebasing vs Merging
- Interactive Rebasing
- Cherry Picking Commits

Git Configuration

- Patches & Blaming
- Untracking Files
- Config & Aliases
- Line Endings & Git Attributes

Social Coding with Github

- Issues and Pull Requests
- Github Workflows
- Managing Multiple Remotes
- Markdown & Wiki
- Github Pages & Profiles



Course Project

Contribute to
OpenSource

Setup Github Profile and contribute to an opensource project on Github

Contact us

 support@onthegomodel.com

 www.ccbp.in