# Educational Overview

Randall Nagy’s **Introduction to Programming Seminar** is a one-day educational opportunity. The Seminar is designed to show you how to create your own data management applications, on your own laptop computer, in a single day.

Programming Language  
This Seminar uses the Python programming language. Commonly available on every popular operating system, Python powers countless applications in data science, software development, machine learning, artificial intelligence, and in the Cloud.

## Educational Approach

A critical-path approach this **Introduction to Programming Seminar** focuses upon the core-concepts you’ll need to **C**reate, **R**ead, **U**pdate, **D**elete, and **S**earch (CRUD+S) records stored in memory, within Comma Separated Variable (CSV) Files, as well as in SQL Databases.

Introductions to professional topics such as flowcharts, design patterns, testing, databases, data types, collections, and downloading projects from GitHub are part of this learning experience.

## Topics Include:

1. Overview & Introduction
   1. The Three Things All Programs Must Do
   2. Installing Python
   3. IDE’s & Code Editing Caveats
2. Python Basics
   1. The R.E.P.L Mode
   2. Flowcharting Basics
   3. Comments & Conditional Blocks
   4. First-Class Functions
   5. Functional Tests
3. Intermediate Python
   1. Classic Data Types
   2. Common Collection Types
   3. Data Validation
   4. Exception Management
4. Using GitHub
   1. Prompter 9000
   2. PyDAO 9000
   3. PyQuest
5. Application Creation
   1. The C.R.U.D+S Design Pattern
   2. Managing Internal Data Storage
   3. Querying By Example
   4. Data Interchange Formats
   5. SQLite
   6. From Text User Interface (TUI) to GUI
   7. Formatting & Reporting Basics

Upon successful completion of this **Introduction to Programming Seminar** you’ll be able to write, test, enhance and maintain software. You’ll not only have the technical skills required to learn more about programming, Modern Python, and computer science, but also walk away with problem-solving abilities required to create software on your own computer.

## Seminar Prerequisites

Students must provide their own laptop computers for personal use during this seminar. Please note that basic computer skills are required. The ability to type, use your operating system’s clipboard, locate and open files, as well as to download and install software will be required.

Before attending the **Introduction to Programming Seminar** students are strongly encouraged to have a version of **Python 3.6** or greater already installed on their computers. (\*)

## Student Computers

Student computers must be running either:

* Microsoft Windows 10 or later
* macOS 11 or greater
* Any Linux supporting Python 3.6 or later

(\*) The latest version of the Python programming language is freely installable from **python.org**.