**Course Name: Machine Learning Programming**

**Course Code:** CCS 311

**Credit Units** 3

**Pre-requisite: CIR 205 Object Oriented Programming II**

**Purpose of the course:** This course is an introduction to the Python programming language for students with prior programming experience. The course aims to provide students with an understanding of the role computation can play in solving problems and to help students, feel justifiably confident of their ability to write programs that allow them to accomplish useful goals.

**Expected Learning Outcomes**

At the end of the course, the learner should be able to:

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|  | Topics |
| Week 1,2 | Introduction to Python Main  Data structures, and basic operations and functions;  Python basics: basic syntax, loops and conditionals.  Introduction, Anaconda. Jupyter Functions,  Lab session |
| Week 3,4 | Data structures II, control flow, Numerical data  Python functions  Object-Oriented Programming  Advanced Data Structures (Tuples, Dictionaries)  Lab session. |
| Week 5,6 | Scientific Python Programming and Data Processing: Numerical Processing with NumPy  [Python: Operations on NumPy Arrays](https://www.geeksforgeeks.org/python-operations-on-numpy-arrays/) , Slicing and indexing arrays  NumPy Operations – Linear Algebra  Lab Session |
| Week 7,8 | Data Analysis and Processing   * [Understanding Data Processing](https://www.geeksforgeeks.org/ml-understanding-data-processing/) * [Overview of Data Cleaning](https://www.geeksforgeeks.org/data-cleansing-introduction/) * [Slicing, Indexing, Manipulating and Cleaning Pandas Dataframe](https://www.geeksforgeeks.org/slicing-indexing-manipulating-and-cleaning-pandas-dataframe/) * [Working with Missing Data in Pandas](https://www.geeksforgeeks.org/working-with-missing-data-in-pandas/)   Lab Session |
| Week 9,10 | Data analysis and visualization matplotlib  Plotting with Seaborn.  Lab session. |
| Week 11 | Setting up virtual environments |