| Course Title | Course Code | Credit Hours |
|---|---|---|
| Fundamentals of Programming II | CS-223 | 0-1 |

**Textbooks:**

- Guttag, John, "Introduction to Computation and Programming Using Python: With Application to Understanding Data Second Edition", MIT Press
- Stephen J. Chapman "MATLAB programming for Engineers", Cengage Learning

**Reference Books/Materials:**

- Luciano Ramalho, "Fluent Python: Clear, Concise, and Effective Programming", O'Reilly Media
- William J. Palm III, "Introduction to MATLAB for Engineers MATLAB user guide: the language of technical computing", McGraw Hill
- Kaggle Online Courses (https://www.kaggle.com/learn)
- Kaggle Online Courses at Coursera (https://www.coursera.org/courses?query=kaggle)
- Python Resource Material (https://education.python.org/resources/resource/list )

**Course Objectives:**

- This course introduces students to more advanced programming concepts. Students will learn to create more powerful programs within a specific programming language of Python and MATLAB.

**Course Outline:**

- Introduction to Python: Installation and overview of different variants of python and their purpose
- Basic elements of Python: Objects expressions, numerical types, variables and assignments
- Branching programs, Type Str and input, iterations
- Basic numerical programming: For loops, approximate solution and bisection search
- Functions and Abstraction
- Structured types, mutability and higher order functions

- Strings, tuples, lists and dictionaries
- Debugging and testing
- Introduction to MATLAB: Overview of MATLAB Environment
- MATLAB basics: variables, arrays, multidimensional arrays, displaying output data, Introduction to plotting
- Branching statements and program design, Loops
- User defined functions
- Complex data handing and multi-dimensional plotting
- Complex data handling and multi-dimensional plotting.
- Advanced features and GUI design
- Introduction to Simulink: overview of different libraries