ITMD 413 SYLLABUS

ITMD 413 Open Source Programming

Hours: 3 credit hours / 45 contact hours

Instructor: Sheikh "Sam" Shamsuddin

Textbook, title, author, and year: *Starting Out with Python, 4th Ed.,* by Tony Gaddis, 2018.

Specific course information

a. **Catalog description:** Contemporary open-source programming languages and frameworks are presented. The student considers design and development topics in system, graphical user interface, network, and web programming. Dynamic scripting languages are covered using object-oriented, concurrent, and functional programming paradigms. Concepts gained throughout the course are reinforced with numerous exercises which will culminate in an open-source programming project.
b. **Prerequisites:** ITMD 411
c. **Required.**

Specific goals for the course

a. **Course Outcomes:**
   - Learn how to write computer programming using Python language.
   - Learn the Python language, its structure, syntax concepts, libraries and application.
   - Learn Input/output, functions, data types, control structures, and lists/arrays.
   - Demonstrate Object Oriented Programming using Python.
   - Become confident in developing and writing Object Oriented Programs.
   - Test, design and solve problems using Python Programming Language

b. **Course Student Outcomes:**
   Upon successful completion of the course the student should be able to do the following:
   - Write, compile, execute, troubleshoot, and resolve problems using the Python Programming Language and its features.
   - Demonstrate Object Oriented Programming methodology in program development.
   - Identify important Python ample libraries.
   - Outline the fundamentals of Data Science.
   - Locate and use Help Resources.
   - Demonstrate implementation of a Graphical User Interface (GUI).
   - Analyze and evaluate software application and development theory and concepts.

Topics to be covered

a. Data Class and course introduction.
   i. Downloading using and Python.
   ii. Learning simple Python programs.
b. Simple I/O. Decision Structures.
c. Repetition Structures. Functions.
d. Lists and Tuples.
e. File I/O and Exceptions.
f. Creating Graphs with Matplotlib and Strings in Python.
g. Data Analysis with Numpy.
h. Statistical Data Analysis with Pandas.
i. Data Visualization with Python seaborn package.
j. Dictionary, and Sets
k. Classes and Object-Oriented Programming.
l. Object Oriented Programming.
m. Inheritance.
n. Recursions and Graphical User Interface (GUI).