Title (Units):	**COMP1007 Introduction to Python and Its Applications (3,2,1)**
Course Aims:	This course provides an introduction to problem solving and programming using the Python scripting language. A variety of practical applications of Python will also be introduced through a series of hands-on exercises.
Prerequisite:	Nil

	Anti-requisite:	COMP1005 Essence of Computing (Year 2021 and onwards), COMP3047 Software Engineering, JOUR4046 Integrated Date-driven Storytelling, MATH3097 Programming with Mathematical Software

Course Intended Learning Outcomes (CILOs):
Upon successful completion of this course, students should be able to:

No.	Course Intended Learning Outcomes (CILOs)
	Knowledge
1	Interpret the fundamental programming constructs of Python, including variables, expressions, functions, control structures, and lists.
2	Explain how problems in various application domains can be solved using Python.
	Professional Skill
3	Implement software programmes designed using Python to solve practical problems.

Calendar Description:	This course provides an introduction to problem solving and programming using the Python scripting language. A variety of practical applications of Python will also be introduced through a series of hands-on exercises.

Teaching and Learning Activities (TLAs):

CILOs	Type of TLA
1-2	Students will attend lectures to learn the concepts of programming constructs of Python and its applications in various domains.
2-3	Students will attend programming sessions to gain practical skills on Python scripting development.
2-3	Students will work on programming exercises and assignments to enhance what they have learnt.

Assessment:

No.	Assessment Methods	Weighting	CILOs to be addressed	Description of Assessment Tasks
1	Programming assignments	20%	1-3	Practicing a functional problem-solving approach to solve a variety of homework problems.
2	Project	20%	2-3	Group project to evaluate students' practical skill of Python programming.
3	Practical test	20%	1-3	An individual assessment will be conducted to evaluate the student's understanding in Python programming.
4	Examination	40%	1-3	Final examination questions are designed to see how far students have achieved their intended learning outcomes.

Assessment Rubrics:

Excellent (A)	•	Able to design and construct complicated Python scripts to solve a variety of problems, as seen in various domains.
	•	Demonstrate an excellent self-learning capability.
Good (B)	•	Able to design and construct useful Python scripts by combining and extending examples.
	•	Demonstrate a good understanding of how Python could be used in various domains.
	•	Full mastery of all basic Python programming constructs.
Average (C)	•	Able to develop Python scripts with substantial help and guidance.
	•	Adequate knowledge on basic Python programming constructs.
Satisfactory (D)	•	Produce a less than workable Python script.
	•	Able to explain the correct use of each basic programming construct in Python.
Unsatisfactory (F)	•	Unable to identify and explain the basic programming constructs in Python.
	•	Unable to create his/her own Python scripts.

Course Content and CILOs Mapping:

Content		CILO No.
I	Python Fundamentals	1 - 3
II	Hands-on experience in various applications in Python	1 - 3

References:

- G. Ciaburro, Hands-On Simulation Modeling with Python: Develop simulation models to get accurate results and enhance decision-making processes. Birmingham, England: Packt Publishing, 2020.
- B. Lubanovic, Introducing python: Modern computing in simple packages, 2nd ed. Sebastopol, CA: O′Reilly Media, 2019.
- L. Vaughan, Impractical python projects: Playful programming activities to make you smarter. San Francisco, CA: No Starch Press, 2018.

Course Content:

Topic

I. Python Fundamentals
    1. Program control and logic
    2. Data types and structures
    3. Function
    4. Text processing
    5. Handling quantitative data

II. Hands-on experience in various applications in Python
    The topics will be selected from, but are not limited to, the following:
    1. Finding frauds in data with Benford's law
    2. Personal product recommendation with collaborative filtering
    3. Unlock business insights with Markov chain models
    4. Decision making with optimal stopping theory