

IS5312: ANALYTICAL PROGRAMMING WITH PYTHON

Effective Term

Semester A 2026/27

Part I Course Overview

Course Title

Analytical Programming with Python

Subject Code

IS - Information Systems

Course Number

5312

Academic Unit

Information Systems (IS)

College/School

College of Business (CB)

Course Duration

One Semester

Credit Units

3

Level

P5, P6 - Postgraduate Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

Nil

Exclusive Courses

Nil

Part II Course Details

Abstract

The aim of this course is to introduce the students to programming concepts and skills with python, with emphasis on data analytics in business applications. On completion of this course, student should be able to: a) understand python basics including control flow, functions, modules, libraries and object oriented programming; b) understanding basic algorithms in data analysis; c) construct data structure to analyse particular business data and solve practical business problem by integrating python modules, files and database technologies.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Design and develop appropriate programming skill for business data analytics.	30			
2	Design and develop appropriate solution for business problems.	20	x	x	x
3	Explore and visualize data analysis results with data analytic toolkit Pandas, Numpy etc. in Python.	25	x	x	x
4	Design basic module/class structures and algorithms for business applications.	25			

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

LTAs		Brief Description	CILO No.	Hours/week (if applicable)
1	Lecture	Students will learn the concepts and general knowledge of python programming. Furthermore, programming algorithm and skills, such as object oriented programming, drawing and animation, files handling, linking to databases, and basic data structures are explained and illustrated using examples to enable students understanding on how to get insights using practical business data.	1, 2, 3, 4	

2	Laboratory	Students will spend time to reinforce and practice various business software construction techniques learnt in lectures through the following activities during laboratory sessions. Exercises: Hands-on activities using a programming toolkit (python) as data analytical tool.	1, 2, 3, 4	
3	Project	Students would have to complete a project requiring them to aiming at solving a practical business problem and build prototype for to be used in business applications.	1, 2, 3, 4	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("- for nil entry)	Allow Use of GenAI?
1	Continuous Assessment Participation in class and lab sessions in activities such as: - a number of take-home exercises - class performance - online quizzes	1, 2, 3, 4	10	-	Yes
2	Mini-Project Each students will design and develop an algorithm by using appropriate python modules and programming techniques	1, 2, 3, 4	40	-	Yes
3	Individual Lab Test The individual lab test is to assess students' overall competence level in the domain areas.	1, 2, 3, 4	50	-	No

Continuous Assessment (%)

Minimum Continuous Assessment Passing Requirement (%)

30

Assessment Rubrics (AR)

Assessment Task

AT1: Continuous Assessment (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Capability to design and develop appropriate data analytical skill for business applications.

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

AT1: Continuous Assessment (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Capability to design and develop appropriate data structure for business data analytics.

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

AT1: Continuous Assessment (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Capability to design and develop appropriate program to handle files and data using databases for business applications.

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

AT1: Continuous Assessment (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Capability to develop basic data structures and algorithms for business decision making.

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

AT2: Mini-Project (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Capability to design and develop appropriate analytical skill for business data analysis.

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

AT2: Mini-Project (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

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Assessment Task

AT3: Individual Lab Test (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Capability to design and develop appropriate analytical skill for business data analysis.

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

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(C+, C, C-) Moderate

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Part III Other Information

Keyword Syllabus

Python programming basics, control flow, functions, series and dataframes, data wrangling, file handling, data structure and analysis algorithms

Detailed Syllabus:

- Python basics
- Python functions
- Python modules
- Series and DataFrames
- Data scraping
- Data wrangling and visualization
- Handling data in database with Python

Reading List

Compulsory Readings

Title	
1	David Schneider, "An Introduction to Programming Using Python", Pearson Education, 2 February 2015.

Additional Readings

Title	
1	Tony Gaddis, "Starting Out with Python", 4th edition, Pearson, March 2017
2	Starting Out with Java: From Control Structures through Objects: International Edition, 6/E, Tony Gaddis, ISBN-13: 978-0133957051
3	https://docs.python.org/3/tutorial/index.html