Department	International College of Liberal Arts		
Semester	Fall 2025	Year Offered (Odd/Even/Every Year)	Every Year
Course Number	DATA240		
Course Title	Data Visualization Techniques in Python		
Prerequisites	DATA150 Introduction to Python Programming AND QREA/PSCI/ECON203 Statistics		
Course Instructor	PARIDA Abhishek	Year Available (Grade Level)	2
Subject Area	Data Science	Number of Credits	3
Class Style	Lecture	Language of instruction	English

(NOTE 1) Depending on the class size and the capacity of the facility, we may not be able to accommodate all students who wish to register for the course

Course Description	This course introduces students to basic statistics and Data visualization techniques using the Python programming language. After a quick revision of essential programming fundamentals, students will be exposed to various data analytics exercises from different case studies.
Class plan based on course evaluation from previous academic year	N/A
Course related to the instructor's practical experience (Summary of experience)	N/A
Learning Goals	The course begins by laying the foundation in probability theory, delving into probability distributions, and covering fundamental statistical concepts.

iCLA Diploma Policy	DP1／DP2

iCLA Diploma Policy

(DP1) To Value Knowledge - Having high oral and written communication skills to be able to both comprehend and transfer knowledge

(DP2) To Be Able to Adapt to a Changing World - Having critical, creative, problem-solving, intercultural skills, global and independent mindset to adopt to a changing world

(DP3) To Believe in Collaboration - Having a disposition to work effectively and inclusively in teams

(DP4) To Act from a Sense of Personal and Social Responsibility - Having good ethical and moral values to make positive impacts in the world

Active Learning Methods	Problem-Based Learning				
More details/supplemental information on Active Learning Methods	N/A				
Use of ICT	The course will take place in the Data Science Lab, which is equipped with the Anaconda distribution of Python and other relevant packages pre-installed. However, for homework assignments, students must use their own laptops and install the Anaconda distribution of Python along with the required packages.				
Contents of class preparation and review	Students are advised to take handwritten notes; this will drastically increase their ability to retain the information. Further, they are expected to practice regularly. One to two hours of study is required before the class preparation, and an equal amount of practice is needed after each lecture.	Hours expected to be spent preparing for class (hours per week)	3 hours	Hours expected to be spent on class review (hours per week)	3 hours
Feedback Methods	The best way to correspond during the course is the UNIPA system or direct emails. Please check the UNIPA account regularly for updates related to classes. To have a better grade, be regular in the study, active and attentive in the class, do a revision of classwork regularly, and participate in-class quizzes.				

Grading Criteria		
Grading Methods	Grading Weights	Grading Content
Understanding of Concepts	40%	In-class discussion, Homework Assignments, Class Quizes, Final Exam
Code Functionality	30%	Homework Assignments, Class Quizes
Timeliness	30%	Homework Assignments

Required Textbook(s)	Allen B. Downey - Think Stats Wes McKinney- Python for Data Analysis José Unpingco - Python for Probability Statistics and Machine Learning
Other Reading Materials/URL	N/A
Plagiarism Policy	Plagiarism is the dishonest presentation of others' work as if it were one's own. Duplicate submission is also treated as plagiarism. Depending on the nature of plagiarism, one may fail the assignment or the course. The repeated act of plagiarism will be reported to the University, which may apply additional penalties.

Other Additional Notes (Outline crucial policies and info not mentioned above)	N/A

(NOTE 2) Class schedule is subject to change

Class Schedule	
Class Number	Content
Class 1	Module 1: Essential Python for the course Lecture 1 - Introduction and overview of selected topics
Class 2	Lecture 2 - Revision - Loops, Numpy and Pandas
Class 3	Module 2: Essential Discrete Mathematics for the course Lecture 3 - Set theory
Class 4	Lecture 4 - Combinatorics
Class 5	Module 3: Computing Probabilities using simulation Lecture 5 - Practics word problems
Class 6	Lecture 6 - Practics word problems (including conditional probabilities)
Class 7	Lecture 7 - Quiz 1
Class 8	Module 4: Probability Distributions Lecture 8 - Discrete Probability Distributions - Preliminaries
Class 9	Lecture 9 - Probability Mass Function and Cumulative Mass Function; Practice Exercises
Class 10	Lecture 10 - Practice Exercises
Class 11	Lecture 11 - Selected discrete distributions - Bernoulli, Binomial, Poisson
Class 12	Lecture 12 - Practice Exercises

Class 13	Lecture 13 - Probability Density Function and Cumulative Density Function; Practice Exercises
Class 14	Lecture 14 - Selected continuous distributions - Normal, Exponential
Class 15	Lecture 15 - Practice Exercises
Class 16	Lecture 16 - Practice Exercises
Class 17	Lecture 17 - Quiz 2
Class 18	Lecture 18 - Quiz solution review
Class 19	Module 5: Descriptive Statistics Lecture 19 - Matplotlib and Seaborn: Types of Data; Types of plots; Exploratory Data Analysis
Class 20	Lecture 20 - Correlation and Covariance matrices
Class 21	Lecture 21 - Exploratory Data Analysis (Case study)
Class 22	Lecture 22 - Exploratory Data Analysis (Case study)
Class 23	Module 6: Inferential Statistics Lecture 23 - Central Limit Theorem; Law of Large Numbers
Class 24	Lecture 24 - Related Proofs
Class 25	Lecture 25 - Hypothesis Testing and Confidence Intervals
Class 26	Lecture 26 - Practice Exercises

Class 27	Lecture 27 - Quiz 3
Class 28	Lecture 28 - Quiz solution review
Class 29	Lecture 29 - Selected Applications
Class 30	Lecture 30 - Selected Applications