

Department	International College of Liberal Arts		
Semester	Fall 2023	Year Offered (Odd/Even/Every Year)	Every Year
Course Number	DATA240		
Course Title	Data Visualization Techniques in Python		
Prerequisites	DATA150 Introduction to Python Programming		
Course Instructor	PARIDA Abhishek	Year Available (Grade Level)	2
Subject Area	Data Science	Number of Credits	3
Class Style	Lecture	Class Methods	Face to face

(NOTE 1) Class Methods are subject to change

(NOTE 2) 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 the students to basic statistics and Data visualization techniques using 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	None
Course related to the instructor's practical experience (Summary of experience)	None
Learning Goals	The aim is to make the students capable of performing Exploratory Data Analysis (EDA) using Python; modules used – Numpy, Pandas, Matplotlib, Seaborn, Sympy.

iCLA Diploma Policy	DP1/DP2
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#### 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 adapt 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	None
Use of ICT in Class	None
Use of ICT outside Class	None

Expected study hours outside class	A = Course credit: 3 B = Prescribed Class hours per credit: 20 C = Prescribed Total Study hours: 135 D = Total class hours: 60 (1 period of 75 minutes = 2 hours: A*B) Preparation and review hours: C - D = 75
Feedback Methods	There will be written remarks on the assignments. And after every quiz, a model answer will be discussed or circulated among the students to aid their understanding.

Grading Criteria		
Grading Methods	Grading Weights	Grading Content
Assignemnts	40%	
Quizes	60%	

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	<a href="https://greenteapress.com/thinkstats2/thinkstats2.pdf">https://greenteapress.com/thinkstats2/thinkstats2.pdf</a> <a href="https://bedford-computing.co.uk/learning/wp-content/uploads/2015/10/Python-for-Data-Analysis.pdf">https://bedford-computing.co.uk/learning/wp-content/uploads/2015/10/Python-for-Data-Analysis.pdf</a> <a href="https://github.com/YikaiZhangskye/ML/blob/master/Unpingco%20J.%20-%20Python%20for%20Probability%2C%20Statistics%2C%20and%20Machine%20Learning%20-%202016.pdf">https://github.com/YikaiZhangskye/ML/blob/master/Unpingco%20J.%20-%20Python%20for%20Probability%2C%20Statistics%2C%20and%20Machine%20Learning%20-%202016.pdf</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	None

(NOTE 3) Class schedule is subject to change

Class Schedule	
Class Number	Content
Class 1	Week 1 Module 1: Essential Python for the course Introduction to the course; Revision of Python programming via various exercises: Sequences/ Data Structures in Python, loops
Class 2	Practice problems and exercises on Sequences/ Data Structures in Python, loops
Class 3	Numpy and Pandas

Class 4	Practice exercises using Numpy and Pandas
Class 5	Matplotlib and Seaborn: Types of plots
Class 6	Practice exercises using Matplotlib and Seaborn
Class 7	Module 2: Introduction to Statistics Definitions and terminologies: Types of data in Statistics
Class 8	Definitions and terminologies: Types of data in Statistics (continuation)
Class 9	Module 3: Descriptive Statistics Central tendency, dispersion
Class 10	Central tendency, dispersion (practice exercises)
Class 11	Practice exercises: Case Studies
Class 12	Practice exercises: Case Studies
Class 13	Module 4: Exploratory Data Analysis (EDA) Aspects of EDA
Class 14	Practice exercises on EDA
Class 15	Module 5: Discrete Probability Distribution Introduction
Class 16	Bernoulli, Binomial, Poisson distributions
Class 17	Probability distributions continued
Class 18	Practice exercises on Probability distributions

Class 19	Exercises and Case Studies
Class 20	Exercises and Case Studies
Class 21	Law of large numbers: Central Limit Theorem: Confidence intervals
Class 22	Practice exercises on the Law of large numbers, the Central Limit Theorem, Confidence intervals
Class 23	Module 6: Inferential Statistics Hypothesis Testing
Class 24	Practice exercises on Hypothesis Testing
Class 25	Module 7: Linear Programming Problems (Extra) Graphical methods
Class 26	Practice exercises on Graphical methods
Class 27	Lagrange multiplier method
Class 28	Practice exercises on Lagrange multiplier method
Class 29	Practice exercise and Case Studies
Class 30	Practice exercise and Case Studies