STATISTICS AND ANALYTICS

Subject Code – AEC201

UNIT NO	Unit skill set (In cognitive domain)	Topics/Subtopics
UNIT-1 **STATISTICAL DATA COLLECTION AND TYPES**	Able to collect statistical data. Able to distinguish the data types. Understands the usage of data collection tools Able to specify problem statement for data collection Able to collect data pointing the root cause of the problem statement.	a Definition of data and classification (qualitative quantitative discrete and continuous data). b Data collection tools i) Questionnaires. ii) Survey. iii) Interviews. iv) Focus group discussion. 1.3 Data cleaning.
UNIT-2 **SUMMARIZATION OF DATA**	Sketches bar, pie and histograms on Microsoft Excel spread sheet. Sketches frequency curve and frequency polygon for the data set on Microsoft Excel spread sheet. Sketches bar, pie and histograms on Microsoft Excel spread	a Descriptive statistics v) Datatabulation(frequency table vi) Relative frequency table. b Grouped data vii) Bar graph viii) Pie chart ix) Line graph x) Frequency polygon xi) Frequency curve xii) Relative frequency polygon xiii) Histograms xiv) Box plot xv) Leaf-stem plot To be done in Microsoft excel.

	sheet. Sketches frequency curve and frequency polygon for the data set on Microsoft Excel spread sheet.	
UNIT-3 **MEASURE OF LOCATION AND DISPERSION**	Able to determine the descriptive statistical variables using Microsoft Excel. Able to determine the absolute measures of dispersion of the given data set. Explain the symmetry and asymmetry of the distributed data.	a Determination of central tendencies Range, Mean, Mode and Median for the data in Microsoft excel. b Determination of absolute measures of dispersion for data like range quartile deviation, mean deviation, standard deviation and variance in Microsoft Excel. c Skewness and kurtosis graphs in Microsoft excel and interpretations of results.

UNIT-4 **INTRODUCTION TO PYTHON PROGRAMMING**	Able Install and run the Python interpreter. Create and execute Python programs. Understand the concepts of file I/O. Able to read data from a text file using Python. Learn variable declarations in Python. Learn control structures.	4.1 Introduction to PYTHON. 4.2 Syntax of PYTHON. 4.3 Comments of PYTHON. 4.4 Data types of PYTHON. 4.5 Variables of PYTHON. 4.6 If-else in PYTHON. 4.6 Loops in PYTHON. 4.7 Arrays and functions in PYTHON.

STATISTICS AND ANALYTICS LAB

Subject Code – AEC201P

SL NO	Practical outcomes/Practical exercises
1	Prepare a questionnaire (closed end) containing 25 questions for a specified problem statement: for example experience of an individual in a restaurant.
2	Prepare a Google form for a specified problem statement to collect the dataset. (for example questionnaire to conduct online quiz)
3	Send out a survey on your problem statement to number of 50 (By Google forms) and collect the data.
4	Remove duplicate or irrelevant observations. Remove unwanted observations from the dataset provided, including duplicate observations or irrelevant observations.
5	In Microsoft Excel spread sheet draw the frequency distribution table for the given data (data set should contain minimum 50 data).
6	In Microsoft Excel spread sheet draw the relative frequency distribution table for the given data (data set should contain minimum 50 data).
7	Using Microsoft Excel spread sheet plot bar graph for the data collected from 100 people(for example, conduct a survey on the favorite fruit of a person in your locality(restricting to 5 to 6 fruits). Explain the bar graph with minimum 30 words.
8	Using Microsoft Excel spread sheet plot pie chart for the data collected from 50 people(for example, conduct a survey on the smokers with respect to their ages in your locality. Explain the pie chart with minimum 30 words.
9	Using Microsoft Excel spread sheet draw a line graph for the given dataset.
10	Using Microsoft Excel spread sheet draw frequency polygon and frequency curve for the data collected from 50 people. (For example, marks obtained by the students in your class in 5 subjects in previous examination). Explain your observations from the graph in minimum 30 words.

11	Using Microsoft Excel spread sheet construct a box plot for the given dataset. (For example dataset can be the number of passengers in a flat form at different time in a day).
12	Using Microsoft Excel spread sheet construct a leaf plot for the given dataset. Explain the graph with minimum 30 words.
13	Using Microsoft Excel spread sheet find the Mean, Mode and Median for the data (univariate data) given and also represent them in a Histogram.
14	Generate a 50 random data sample (even and odd number dataset) using Microsoft Excel spread sheet and determine the range and Quartiles.
15	Collect the current yield of a crop from 50 different persons (problem statement can be changed according
	to priorities of the tutor) in your locality and determine mean deviation and Quartile deviation in Microsoft excel spread sheet and brief your inference with less than 30 words.
16	Collect the data of any 2 livestock population from 50 different houses in your locality (problem statement can be changed according to priorities of the tutor) and determine standard deviation for both the two separately in Microsoft excel spread sheet and brief your inference with less than 30 words.
17	Collect the data of two wheeler (with a rider and a pillion) crossing a busy junction in your locality in the peak hours (problem statement can be changed according to priorities of the tutor) and determine the variance of the data in Microsoft excel spread sheet and brief your inference with less than 30 words.
18	Using Microsoft Excel spread sheet draw a Skewness graph and kurtosis graph for randomly generated dataset.
20	Write a python program to add 2 integers and 2 strings and print the result.
21	Write a python program to find the sum of first 10 natural numbers.
22	Write a python program to find whether the number is odd or even.
23	Write a python program to find the variance and standard deviation for the given data..
24	Write a python program to display student marks from the record.

25	Write a python program to create a labeled bar graph using matpoltlib. pyplot.
26	Write a python program to create a labeled pie chart using matpoltlib. pyplot.

SUGGESTED LEARNING RESOURCES:

1. Statistical Analysis with Excel For Dummies (For Dummies Series) Paperback – Import, 9 April 2013 by Joseph Schmuller (Author)
2. https://www.brianheinold.net/python/A_Practical_Introduction_to_Python_Programming_Heinold.pdf
3. http://www.bikeprof.com/uploads/9/0/6/5/9065192/excel_stats_handout_npl.pdf
4. https://adminfinance.umw.edu/tess/files/2013/06/Excel-Manual1.pdf
5. https://www.brianheinold.net/python/A_Practical_Introduction_to_Python_Programming_Heinold.pdf
6. Introduction to Python programming for beginners by Vivian Baily Kindle edition.
7. PYTHON PROGRAMMING: Python programming: the ultimate guide from a beginner to expert by Clive Campbell.
8. Open source for python: https://hub.gke2.mybinder.org/user/jupyterlab-jupyterlab-demo-zfkdwy4y/lab