

## **COURSE SYLLABUS FOR STATISTICAL ANALYSIS USING PYTHON**

**Course Description:** Like R, Python is also used worldwide. It is used in almost every industry, ranging from finance, banking to medicine and manufacturing. Many international and national companies adopt R and Python to cater to their data/statistical analysis requirement. Hence, we must learn how to use and understand Python (as well) basics since it has become ubiquitous in research and management. In this workshop, participants will learn how to manage and analyze their data using Python.

Python is a programming language that lets you work more quickly and integrate your systems more effectively. Further, Python can be easy to pick up whether you're a first time programmer or you're experienced with other languages.

Further, this workshop is designed for people who have very little experience with statistics. e will focus on the basic analyses, procedures and best practices that any researcher should consider when faced with a new dataset. All this will be explored in a hands-on fashion using the free statistical software package Python.

### ***The objectives of the training-workshop are the following:***

- \*Understand how each statistical analysis works, such as the assumption and data requirements.
- \*Learn how to run the statistical analysis using Python.
- \*Learn how to manipulate and manage data using Python.
- \*Identify the right statistical tool for a specific business or research problem.

### ***Course Outline***

- Refresher to Statistics
- What is Python? What is its difference to R?
- Introduction to Python (interface and environment)
- Data Management using Python
- Exploratory Data Analysis
- Data Cleaning using Python
- Data Management using Python
- Chi-square test of Independence
- Test of Difference: Mann-Whitney U Test,
- Test of Difference: Kruskal Wallis-H
- Parametric Test:
  - Paired Samples T-test,
  - Independent Samples T-test,
  - One-way ANOVA
- Running Correlation Analysis:
  - Pearson,
  - Spearman
  - Kendal Tau
- Identifying the right statistical test and running the test using Python

## Program of Activities

### *Day 1: Fundamentals of Statistical Analysis - Lecture*

<i>Opening of the workshop (Doxology, National Anthem and opening remarks)</i>	8:45AM to 9:00AM
<i>Refresher to Statistics</i>	9:01AM to 10:30AM
<b><i>Recess/Break</i></b>	10:31AM to 10:45AM
<i>What is Python?</i>	10:46AM to 11:10AM
<i>Introduction to Python (interface and environment)</i>	11:11AM to 11:59AM
<b><i>Lunch Break</i></b>	12:00PM to 1:00PM
<i>Data Management using Python</i>	1:01PM to 2:30PM
<i>Hands-on activities</i>	2:31PM to 4:00PM
<b><i>Dismiss</i></b>	

### *Day 2: Workshop*

<i>Tete a Tete (participants may consult the speakers through breakout rooms)</i>	8:45AM to 9:00AM
<i>Introduction to Python (interface and environment)</i>	9:01AM to 10:30AM
<b><i>Recess/Break</i></b>	10:31AM to 10:45AM
<i>Running an Exploratory Data Analysis/Data Cleaning using Python</i>	10:46AM to 11:59AM
<b><i>Lunch Break</i></b>	12:00PM to 1:00PM
<i>Activity: Running Chi-square test of Independence, Mann-Whitney U Test, Kruskal Walis-H</i>	1:01PM to 2:30PM
<b><i>Break/Recess</i></b>	2:31PM to 2:45PM
<i>Continuation, Running Chi-square test of Independence, Mann-Whitney U Test, Kruskal Walis-H</i>	2:46PM to 4:00PM
<b><i>Dismiss</i></b>	

### *Day 3: Workshop*

<i>Running Parametric Test: Paired Samples T-test, Independent Samples T-test, One-way ANOVA</i>	9:01AM to 10:30AM
<b><i>Recess/Break</i></b>	10:31AM to 10:45AM
<i>Continuation, Paired Samples T-test, Independent Samples T-test, One-way ANOVA</i>	10:46AM to 11:10AM
<i>Running Correlation Analysis: Pearson, Spearman and Kendal Tau</i>	11:11AM to 11:59AM

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<b><i>Lunch Break</i></b>	12:00PM to 1:00PM
<i>Activity: Identifying the right statistical test and running the test using Python</i>	1:01PM to 2:30PM
<b><i>Break/Recess</i></b>	2:31PM to 2:45PM
<i>Activity: Identifying the right statistical test and running the test using Python</i>	2:31PM to 4:00PM
<b><i>Dismiss</i></b>	

REQUIRED SOFTWARE FOR THIS WORKSHOP:

- Zoom
- Python
- Gmail account for Google Classroom

