CBEL Code: ELO-202

Course Name: Fundamentals of Exploratory Data Analysis & Statistical Thinking in Research

Duration: 40 hours

Credits: 4		
Lecture Hours	**Practical/Activity Hours**	**Mode**
16	24	**Blended**

Course Objective- This statistics and data analysis course will help to build up the statistical foundation related to any statistical approach taken into a research problem and the practicalities involved in how to collect, process and analyze data.

Learning Outcome- How to exercise statistical thinking in designing a research. Data collection, derive insights from visualizing data, obtain supporting evidence for data-based decisions and construct models for predicting future trends from data.

Hands on learning of Statistical Methods using Excel – Minitab – SPSS used in Research & Analysis.

Lecture - Interaction	Content / Topic	Hours
L1	Introduction **Unit 1**: Formulation of Research Problem & Statistical Thinking	4
L2	Data Processing & Visualization	2
L3	Numerical Data, Summary Statistics & Descriptive Statistics	2
L4	**Unit 2** : Data Modelling & Analysis	4
L5	**Unit 3** : Interpretation and Outcomes	4
[L1 – L5]	**Total Hrs. of Lectures – Interaction**	**16**

UNITWISE CONTENT	
UNIT 1 : Formulation of Research Problem & Statistical Thinking	How to design a Research problem Writing statistical hypotheses Planning your research design Measuring variables Collect data from a sample Sampling Procedures Sufficient Sample Size
Data Processing & Visualization:	Organizing data from each variable in frequency distribution tables Displaying data from a key variable in a bar chart to view the distribution of responses. Visualizing the relationship between two variables using a scatter plot
Numerical Data, Summary Statistics & Descriptive Statistics:	Inspecting data insights Calculation & Summarization
UNIT 2: **Data Modelling & Analysis:** **in the population**	Testing of hypotheses about relationships between variables
UNIT 3: Interpretation and Outcomes:	Statistical significance Effect size, Interpret your Results, Decision Errors Statistical Findings and Limitations

Suggested Readings

Statistical Analysis in Microsoft Excel and SPSS by Riyanka Jain

Field, A. (2005). Discovering statistics using SPSS. 2ndEd. London: Sage Publications.

Mann, Prem. (2001). Introductory statistics. 4th Ed. Upper New York: John Wiley & Sons.

Weinberg, S.L. & Abramowitz (2008). Statistics using SPSS: An integrative approach. 2ndEd. New York: Cambridge University Press.

Statistics for Research with a Guide to SPSS, Third Edition by George Argyrous.

ASSESSMENT SCHEME				
• Interim Formative Assessment [A1-A2: 2 Hours] • Course-end Summative Assessment [A3: 28 Hours]				
Formative Assessment- X				
Sl No.	Hours	Content / Topic	Assessment Type	Marks
A1	1	Content / Topics covered in Unit-1	Practical	40
A2	1	Content / Topics covered in Unit-2	Practical	30
A3	1	Content/ Topics covered in Unit-3	Practical	30
			Total [A1 + A2+ A3]	100
Summative Assessment- Y				
A4	21	Recommended MOOCS Courses/ Group Project	Certification/ Presentations	100
Computation of Final Score: [X + Y] • **X :** 20% of total marks obtained out of total marks 100 in Formative Assessment cumulatively (A1+A2+A3) • **Y :** 80% of marks obtained out of total marks 100 in Course-end Summative Assessment (A4)				
Gradation Scheme: • 90 – 100 : O : Outstanding • 80 – 89 : A : Excellent • 70 – 79 : B : Very Good • 60 – 69 : C : Good • 50 – 59 : D: Pass				
Eligibility for Certification: • Attendance & active participation in at least class lectures/interactions • Successful completion of the campaign of all the three activities/assignments aspart of Formative Assessment [A1, A2 & A3] • Obtaining minimum Grade D as per the formula for computation of Final Score statedabove NB: A candidate must satisfy all the criteria mentioned in order to receive the coursecompletion certificate				