INFERENTIAL DATA ANALYSIS

UNIT CODE: MATH/CU/AS/CR/04/6/A

Relationship to Occupational Standards
This unit addresses the unit of competency: Perform inferential data analysis

Duration of Unit: 200 hours

Unit Description
This unit specifies the competencies required to perform inferential data analysis. It involves, apply data transformation techniques, create new variables, perform statistical model selection, obtain parameter estimates, interpret analysis results, prepare analysis report and Prepare findings presentation

Summary of Learning Outcomes

1. Apply data transformation techniques
2. Create new variables.
3. Perform statistical model selection
4. Obtain parameter estimates.
5. Interpret analysis results.
6. Prepare analysis report.
7. Prepare findings presentation

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods

1. Apply data ***transformation techniques***	• Transformation formulas & Procedures
	  • Number assignment (coding)
	  • Logarithmic
	  • Reciprocals
	  • Powers
	  • Grouping
	  • Exponents
	  • Likelihood functions
		• Written test
		• Observation
		• Third party report
		• Oral questioning
		• Interviews

2. Create new variables.	• Creating new variables • Recording into new variables	• Written test • Observation • Third party report • Oral questioning • Interviews

Learning Outcome	Content	Suggested Assessment Methods

3. Perform ***statistical model*** selection	• Statistical Modelling
	  • Definition of terms
	  • Theory
	  ▪ Independent & dependent variables
	  ▪ Type of variables
	  • Practice
	  ▪ Practical examples & illustrations
	  ▪ Simulations
	• Statistical models
	  • Generalized linear models (GLM)
	  ▪ Simple and
	  ▪ Multiple regression
	  • Non-linear models
	  • Logistic regressions
	• Choice of statistical models
		• Written test
		• Observation
		• Third party report
		• Oral questioning
		• Interviews

4. Obtain parameter estimates.	• Estimation of Model Parameters and Its Inferences
	  • Mean (μ)
	  • Standard deviation (δ)
	  • Proportion (*p*) in Binomial distribution
	  • Difference of Mean ($\mu_1 - \mu_2$)
	• Confidence Intervals (CI)
	  • 95% CI
	  • 99% CI
	• Coefficients for simple linear and multiple linear regression
	  • OLS
		• Written test
		• Observation
		• Third party report
		• Oral questioning
		• Interviews

Learning Outcome	Content	Suggested Assessment Methods

5. Interpret analysis results.	• Interpretation of analysed data based on
	  • Parameter estimates - decision making
	  • Statistical method (e.g. Correlation, Student t-test, ANOVA
	  • Regression Model estimates
	  • Prediction
	  • Forecasting
		• Written test
		• Observation
		• Third party report
		• Oral questioning
		• Interviews

6. Prepare analysis report.	• Report writing
	  • Types of reports
	  • Informational
	  • Analytical
	  • Report formats
	  • Terms of reference
		• Written test
		• Observation
		• Third party report
		• Oral questioning
		• Interviews

7. Prepare findings presentation	• Presentation of Results
	  • Tables
	  • Ordinary/Simple tables
	  • Cross tabulation
	  • Custom tables
	  • Charts/Graphs
	  • Histograms/stem & leaf displays
	  • Frequency polygons
	  • Bar and Pie charts
	  • Cumulative frequency curves
	  • Percentiles/Box & Whisker plots
	• PowerPoint
		• Written test
		• Observation
		• Third party report
		• Oral questioning
		• Interviews

Suggested Methods of Instructions

- Projects
- Demonstration by trainer

- Practice by the trainee
- Discussions
- Direct instruction

Recommended Resources

1. Computer
2. Software
3. Stationary
4. Printer
5. Data sets
6. Projector