JAIPURIA INSTITUTE OF MANAGEMENT
PGDM; TRIMESTER II; ACADEMIC YEAR 2018-19

Course Code and title	**OM 201: Statistics for Management**
Credits	3
Term and Year	II Term, 2018 -19
Course Requirement(s)	
Course Schedule (day and time of class)	As per timetable
Classroom # (Location)	As per timetable
Course Instructor	Prof. Sonali Singh / Dr. Richa Misra / Dr. Surender Kumar
Course Instructor Email	sonali.singh@jaipuria.ac.in; richa.misra@jaipuria.ac.in; surender.kumar@jaipuria.ac.in
Course Instructor Phone (Office)	0120-4638300 Ext 385/332/347/330
Student Consultation Hours	
Office location	Second Floor

Course Overview

OM-201 is an introductory course in Decision Sciences. Business decisions are rarely made by intuitions alone. Statistics and quantitative techniques can enable managers and decision makers to analyze business situations and make informed business decisions on the basis of this analysis. The core purpose of this course is to help students to analyze different problem situations. To achieve this purpose, basic understanding and learning of tools and techniques of Statistics is important. It will be helpful in developing analytical thinking approach among students so that they may take objective decisions in their personal and professional life thereby reducing the risk of making wrong decisions. The emphasis throughout the course is on reasoning, analysis and interpretations rather than on technical details. Working knowledge of MS-Excel is pre-requisite for the course and OM-201 in itself a pre-requisite for Business Research Methods, Marketing Research and Data Analytics courses.

Graduate Attributes (GAs), Key Differentiators (KDs), Programme Learning Outcomes (PLOs), and CLOs

Course Learning Outcomes (CLO)

At the end of the course, the students should be able to:
CLO1: Explain and perform exploratory data analysis. **(K)**
CLO2: Calculate probability-estimates to represent uncertainty. **(K)**
CLO3: Apply sample(s) data to infer about the population. **(S)**
CLO4: Estimate relationship between two or more variables. **(S)**

Books and References

Text Book

Statistics for Management, Richard I. Levin, David S. Rubin, M. H. Siddiqui, S. Rastogi, Pearson Education, Delhi, 2017, 8th Edition.

References:

Business Statistics for Contemporary Decision Making, Ken Black, 5th Edition, Wiley India Pvt. Ltd.

Statistics for Managers Using Microsoft Excel-Levine, Stephan, Krehbiel & Berenson, 5th Edition, PHI Learning Pvt. Ltd.

Complete Business Statistics-Aczel, 6th Edition, Tata Mcgraw–Hill.

Aczel Amir D, Complete Business Statistics, Tata McGraw Hill Publishing, Company Limited, New Delhi, 2009, 6th Edition.

. Session Plan

Session	Topic/ Sub Topic	Reading Reference	Pedagogy	Session Learning Outcomes	CLO
Module I: Descriptive Statistics					
1.	• Introduction • Presenting the Data • Exploratory Data Analysis	Text, Chpt: 2 Page: 14-40	Discussion & Caselets	To make students learn the importance of using data in business decision making and how to compile and present the data	CLO1
2.	• Measures of Central Tendency (Mean, Weighted Mean, Median & Quantiles)	Text, Chpt: 3 Page: 74-104	Case – Nirmal: Discussion & Solving by MS Excel, Problem Solving	To make students learn how, when and why we use different measures of central tendency	CLO1
3.	• Coefficient of Dispersion • Coefficient of Variation	Text, Chpt: 3 Page: 111-135	Case – Nirmal: Discussion & Solving by MS Excel, Problem Solving	To make students learn how, when and why we use different measures of dispersion and relative measures	CLO1
4.	• Measures of Shapes: Skewness & Kurtosis • Box-Plot and Stem & Leaf • Five-Point Summary	Instructor Handouts	Case – Nirmal: Discussion & Solving by MS Excel, Problem Solving	To make students understand relative measures and how distributions are different based on their shapes	CLO1
Module II: Probability & Probability Distributions					
5.	• Introduction and applications of probability • Different approaches towards probability	Text, Chpt: 4 Page: 154-171	Caselets, Problem Solving	To recognize and quantify the uncertainty involved in real world business problems	CLO2

	• Probabilities under the conditions of independence • Law of Addition				
6.	• Probabilities under the conditions of dependence • Conditional, Joint and Total probability	Text, Chpt: 4 Page: 172-188	Case: Academic performance, Problem Solving	To understand the independent and dependent events and estimate probabilities	CLO2
7.	• Insights from Additional information • Priori & Posteriori Probabilities • Bayes Theorem	Text, Chpt: 4 Page: 188-196	Caselets, Problem Solving	To learn that estimates of probability can be revised in managerial situations if additional information is available	CLO2
8.	• Random Variables • Expected Value • Application of Expected Value in decision making	Text, Chpt: 5 Page: 210-224	Caselets, Problem Solving	To use expected value to make decisions when there is uncertainty	CLO2
9.	• Binomial & Poisson Distribution • Normal Distribution • Standard Normal Distribution	Text, Chpt: 5 Page: 225-246	Problem Solving Solving Excel	To apply normal distribution in different functional areas	CLO2
Module III: Inferential statistics					
10.	• Sampling: Concept • Sampling Techniques: Random Sampling	Text, Chpt: 6 Page: 278-288	Guest Session	To make students understand the role of sampling in decision making	CLO3
11	• Sampling distribution • Use of standard error	Text, Chpt: 6 Page: 296-304	Discussion Caselets	To make students understand the role of sampling in decision making	CLO2, CLO3
12	• Concept of Estimation • Point and interval estimation • Estimation-How to estimate mean of a population from the sample	Text, Chpt: 7 Page: 328-348	Caselets Solving by MS Excel	To make students learn how to estimate certain characteristics of a population from the sample	CLO2, CLO3

13	Sample size Estimation	Text, Chpt: 7 Page: 364-369	Problem Solving	To make students understand the importance of appropriate sample size and how to estimate	CLO3
14	• Significance Testing-Introduction • Setting up the hypothesis. • Types of errors	Text, Chpt: 8 Page: 379-384	Caselets	To make students learn how to set up hypothesis for business situations	CLO2, CLO3
15	• Conceptual basis to significance testing. • Five-steps testing procedure • Parametric & Non-Parametric Testing • One Sample Test: Testing of mean for population	Text, Chpt: 8 Page: 385-410	Caselets Problem Solving	To enable students to use sample-information to decide whether a population possesses a particular characteristic	CLO2, CLO3
16	• One Sample Test: Testing of mean for population (t-test) • One Sample Test: Testing of proportion for population	Text, Chpt: 8 Page: 411-417	Caselets Problem Solving	To enable students to use sample-information to decide whether a population possesses a particular characteristic	CLO2, CLO3
17	• Two Samples Test: Testing differences between two population-means (Large samples)	Text, Chpt: 9 Page: 425-433	Caselets Problem Solving	To use samples from two populations to decide about how the populations means are compared	CLO2, CLO3
18	• Two Samples Test: Testing differences between two population-means (Small samples) • Concept of p-value	Text, Chpt: 9 Page: 434-444	Case – Nirmal: Discussion & Solving by MS Excel	To use samples from two populations to decide about how the populations means are compared	CLO2, CLO3
19	• Two Samples Test: Paired t test • Testing Difference of Proportions	Text, Chpt: 9 Page: 445-467	Case – Nirmal: Discussion & Solving by MS Excel	To enable the students to decide how the populations can be compared for related samples	CLO2, CLO3
20	• ANOVA	Text, Chpt: 11 Page: 555-581	Case – Nirmal: Discussion & Solving by MS Excel	To enable the students to use samples from more than two populations to decide	CLO2, CLO3

				about how the populations means are compared	
Module IV: Linear Regression and Correlation					
21	• Regression model-to analyze relationship between variables	Text, Chpt: 12 Page: 610-640	Guest Session	To enable students to visualize the relationship between variables	CLO4
22	• Bi-variate Regression model • To estimate the relationship between two variables	Text, Chpt: 12 Page: 641-663	Case –Omni : Discussion & Solving by MS Excel	To enable the students to estimate the relationship between two variable and take decision based on them	CLO2, CLO3, CLO4
23	• Estimating Multiple regression models • Concept of R-square/Adjusted R-square • Examining significance of predictors	Text, Chpt: 13 Page: 678-699	Case – Pampers : Discussion & Solving by MS Excel	To examine decision making situation where there are more than one independent variable and to estimate the strength of relationship	CLO2, CLO3, CLO4
24	• Review and assimilation of the entire course • Summing up the learning and briefing them about the future analytical courses	--	Discussion & Review	Review & Assimilation	

7. Assessment Tasks

Assessment Item	**Description**	**Weightage**	**CLO**
Quiz	There will be 3 quizzes as per schedule. Quizzes will be conducted on Moodle. The duration of each quiz will be 10 minutes with 10 questions. Each quiz will be of 10 marks. Marks obtained in best 2 quizzes will be added and weighted for 20 % in total marks.	30	CLO1, CLO2, CLO3
Group Project	Project will involve application of course content to the primary/secondary data. They will collect the data (Primary/secondary), analyse it and prepare the report for the same. There will be stage wise submission for the project. The Project-Report will consist of following heads:	30	CLO3, CLO4

	•Table of Content •Executive Summary •Introduction •Objective of the Study/Problem: Topic. •Methodology: Data Collection •Concept/Formula used •Calculation/Excel Output (Excel output table included) •Analysis & Interpretation. •Conclusion. •Limitations of the Study •Data Sheet (In Annexure) The Project will be evaluated (on the max. score=20) on the following basis: •Project Report •Group-Viva •Participation. •Peer Feedback (of other members of the Group on the Feedback Form)		
No Mid-Term Examination			
End-Term Examination	It will be based on the entire course. This will consist of application-based questions, situations and /or on case study	40	CLO1, CLO2, CLO3, CLO4

Rubrics for Assessment Tasks

RUBRICS FOR CLOs

CRITERIA	LEVEL 1 BEGINING	LEVEL 2 AVERAGE	LEVEL 3 ACCOMPLISHED	LEVEL 4 EXCELLENT
CLO1: Explain and perform Exploratory Data Analysis (EDA)	Know the name of the Measures of EDA	Understand and explain the measures of EDA	Apply the measures of EDA	Apply the measures of EDA and use for decision making for real business scenario
CLO2: Calculate probability-estimates to represent uncertainty	Know the probability as a mathematical ratio	Understand that probability is a measure of uncertainty	Able to estimate probability measures for business scenario	Able to visualize the uncertainty in business situations and to apply the measures for future decision making

CLO3: Apply sample(s) data to infer about the population	Know the name of sampling schemes, terms and measures of estimation & significance testing broadly	Understand the sampling schemes, terms and measures of estimation & significance testing	Apply the sampling schemes, terms and measures of estimation & significance testing	Apply the sampling schemes, terms and measures of estimation & significance testing to business problems and able to take decisions
CLO4: Estimate relationship between two or more variables	Know the terms	Understand and estimate the regression models and relevant terms	Estimate and apply the regression models and relevant terms for business decision making	Solve the different business problems by applying relevant regression model and able to predict the future scenario and have understanding that regression does not indicate cause & effect

RUBRICS for Quiz

Criteria	**Poor up to 30%**	**Fair 30-60%**	**Good 60-80%**	**Excellent 80% or More**
	UNSATISFACTORY	MINIMAL	PROFICIENT	EXEMPLARY
Clarity of Concepts and ability to apply them	Only up to 30% answers are correct. Most of the concepts are not clear and student is unable to understand the same.	Between 30 – 60% answers are correct. Many of the concepts are clear and understood by student.	Between 60 – 80% answers are correct. Majority of concepts are clear and understood by student.	80% or more answers are correct. Most of concepts are clear and understood by the student.

RUBRICS for Mid Term and End Term

Criteria	**Poor up to 30%**	**Fair 30-60%**	**Good 60-80%**	**Excellent 80% or More**
	UNSATISFACTORY	MINIMAL	PROFICIENT	EXEMPLARY
Clarity of Concepts and ability to apply them	Only up to 30% answers are correct. Most of the concepts are not clear and	Between 30 – 60% answers are correct. Many of the concepts are	Between 60 – 80% answers are correct. Majority of concepts are clear and understood by	80% or more answers are correct. Most of concepts are clear and understood by the student, provide answers

	student is unable to understand the same.	clear and understood by student and able to solve the problems given	student and also provide the answers in business language.	in business language and may also be able to indicate the additional information required for better decision making

RUBRICS for Group Project

CRITERIA	DEVELOPING	APPROACHING PROFICIENCY	PROFICIENT	ADVANCED
Identify the relevant objectives and the information	Objectives inadequately defined Incomplete information identified	Objectives defined but some finer points missing Information identified upto average extent	Objectives well defined Relevant appropriate information identified	Objectives well defined Appropriate information collection from different sources Additional information identified
Collect the appropriate information/data	Inadequate information collection	Average information collection	Adequate information collection	All (directly and indirectly related) information collected
Analyse the data as per the identified objectives	No analysis only presenting the data	Basic analysis performed	Basic & advanced data analysis	Complete and appropriate Data Analysis Able to use Interpretation for decision making
Project Report	Language is poor Defined format is missing Reference is inadequate Table of index is absent Formatting is poor	Language is occasionally poor Format is followed References is somewhat adequate Occasionally format is not good	Is adequately Impressive Format is followed Proper referencing Results & Interpretations is there	Is impressive Impressive Format Proper referencing Results, interpretation, conclusion, limitations, suggestions for future research are there

	Results & Interpretations not there	Results is there but not interpretation		