

Department	International College of Liberal Arts		
Semester	Fall 2023	Year Offered (Odd/Even/Every Year)	Every Year
Course Number	QREA/PSCI/ECON203		
Course Title	Statistics		
Prerequisites	None		
Course Instructor	JHINGAN Sanjay	Year Available (Grade Level)	2
Subject Area	Quantitative Reasoning & Natural Sciences	Number of Credits	3
Class Style	Lecture	Class Methods	Face to face

(NOTE 1) Class Methods are subject to change

(NOTE 2) Depending on the class size and the capacity of the facility, we may not be able to accommodate all students who wish to register for the course"

Course Description	<p>Cap (registrant capacity): 25 students</p> <p>Statistics is the branch of mathematics that studies the collection, analysis, and interpretation of data and it is widely used across all quantitative disciplines.</p> <p>This course will introduce the students to statistical methods, reasoning and evaluation used in investigations in a wide range of fields. The course will cover the following topics: (i) Methods of data collection, graphical and numerical displays to understand the data; (ii) Statistics with R, (iii) Probability, (iv) Discrete and continuous distributions; (v) Confidence intervals; (vi) Significance tests; (vii) Linear regression.</p>
Class plan based on course evaluation from previous academic year	Based on student feedback from previous offering of this course there will be regular in-class quizzes. This will help student understand better their learning and over all progress.
Course related to the instructor's practical experience (Summary of experience)	Not applicable.
Learning Goals	<p>Proficient students will be able to:</p> <p>(i) Produce convincing oral and written statistical arguments in a variety of applied settings.</p> <p>(ii) Choose and use a variety of statistical techniques for: producing data surveys, experiments observational studies simulations, analyzing and modeling data (graphics, probability, distributions, error analysis);</p> <p>(iii) Drawing conclusions from data (confidence intervals, significance tests);</p> <p>(iv) Communicate statistical results effectively.</p> <p>The emphasis of the course will be on developing independent, critical thinking and quantitative reasoning skills.</p>

iCLA Diploma Policy	DP2
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#### iCLA Diploma Policy

(DP1) To Value Knowledge – Having high oral and written communication skills to be able to both comprehend and transfer knowledge

(DP2) To Be Able to Adapt to a Changing World – Having critical, creative, problem-solving, intercultural skills, global and independent mindset to adopt to a changing world

(DP3) To Believe in Collaboration – Having a disposition to work effectively and inclusively in teams

(DP4) To Act from a Sense of Personal and Social Responsibility – Having good ethical and moral values to make positive impacts in the world

Active Learning Methods	Active learning method in this class requires students to work individually or in groups, to solve problems, propose solutions, and explain ideas in writing.
Use of ICT in Class	UNIPA (LMS system), Office 365.

Use of ICT outside Class	UNIPA (LMS system), ChatGPT, Office 365.
Expected study hours outside class	It is important to work each day, especially before and after the class. Plan to spend 8 hours per week for this course.
Feedback Methods	UNIPA, and Office 365 will be used for regular feedback to quizzes. Student can use office hours for discussion.

Grading Criteria		
Grading Methods	Grading Weights	Grading Content
In-class quizzes	100%	Nine quizzes will be conducted during the course.

Required Textbook(s)	J. T. McClave, P. G. Benson, T. Sincich, Statistics for Business and Economics (13th edition), Pearson.
Other Reading Materials/URL	There are several good books on statistics which can be used. Introductory Statistics, Barbara Illowsky and Susan Dean, (available for free download at: <a href="https://openstax.org/details/books/introductory-statistics">https://openstax.org/details/books/introductory-statistics</a> )
Plagiarism Policy	Plagiarism is the dishonest presentation of the work of others as if it were one's own. Duplicate submission is also treated as plagiarism. Depending on nature of plagiarism you may fail the assignment or the course. Repeated act of plagiarism will be reported to the University which may apply additional penalties.
Other Additional Notes	This class will be conducted primarily as an interactive lecture. Students are expected to participate in class discussions in an inquisitive, thoughtful, and constructive manner. We will follow the textbook reasonably closely and students should review the suggested study materials before joining the class.  To have a better grade be regular in the course, be active and attentive in the class, do revision of classwork on a regular basis, and participate in class quizzes.  Students will have a choice between a creative project that interprets the essence of a statistical idea and a problem-solving project that uses statistical techniques from the course to solve a problem that has not been considered in class. Project can be chosen freely based on student's field of interest. Students are invited and encouraged to discuss all phases of the project with the instructor and among each other.

(NOTE 3) Class schedule is subject to change

Class Schedule	
Class Number	Content
Class 1	Lecture 1 Introductory lecture
Class 2	Lecture 2 The science of statistics, Fundamental elements.
Class 3	Lecture 3 Types of data, Sampling.
Class 4	Lecture 4 Types of data, Sampling.
Class 5	Lecture 5 Critical thinking with statistics. In-class quiz.
Class 6	Lecture 6 Describing Qualitative Data, Graphical description.
Class 7	Lecture 7 Measures of central tendency.
Class 8	Lecture 8 Variability. Critical thinking: Distorting truth with descriptive techniques.
Class 9	Lecture 9 A review of concepts. In-class quiz.
Class 10	Lecture 10 Sample space and Probability
Class 11	Lecture 11 Probability Rules. Mutually exclusive events,
Class 12	Lecture 12 Conditional Probability, Independent events. Bayesian rule.

Class 13	Lecture 13 A review of concepts. In-class quiz.
Class 14	Lecture 14 Discrete probability distributions. Binomial Distribution.
Class 15	Lecture 15 Discrete probability distributions. Poisson distribution.
Class 16	Lecture 16 A review of discrete probability distributions. In-class quiz.
Class 17	Lecture 17 Continuous probability distributions. Uniform distribution.
Class 18	Lecture 18 Continuous probability distributions. Normal Distribution.
Class 19	Lecture 19 A review of Continuous probability distributions. In-class quiz.
Class 20	Lecture 20 Sampling distributions. Unbiasedness and minimum variance.
Class 21	Lecture 21 Sampling distributions. Large number hypothesis, Central Limit theorem.
Class 22	Lecture 22 Sampling distributions. in-class quiz.
Class 23	Lecture 23 Inference based on a single sample – confidence interval. Estimating the target parameter.
Class 24	Lecture 24 Inference based on a single sample – confidence interval. Confidence interval for a population mean: Normal (z) statistics
Class 25	Lecture 25 Inference based on a single sample – confidence interval. In-class quiz.

Class 26	Lecture 26 Inference based on a single sample – Hypothesis testing. Formulating hypothesis, significance levels, test of hypothesis.
Class 27	Lecture 27 Inference based on a single sample – Hypothesis testing. Formulating hypothesis, significance levels, test of hypothesis. In-class quiz
Class 28	Lecture 28 Simple linear regression. Probabilistic models.
Class 29	Lecture 29 Simple linear regression. Fitting a model: least square approach
Class 30	Lecture 30 Simple linear regression. In-class quiz.