

Macao Polytechnic Institute

School of Business

Bachelor of Accounting

Module Outline

Academic Year 2020/2021

Semester 2

Learning Module	Business Statistics			Class Code	MATH2110-224
Pre-requisite(s)	Nil				
Medium of Instruction	English			Credit	3
Lecture Hours	45 hrs	Lab/Practice Hours	0 hr	Total Hours	45 hrs
Instructor	Natalie Pang		E-mail	wspang@ipm.edu.mo	
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Description

This module is designed to introduce basic statistical principles, and techniques for data analysis in the context of solving business problems. Students will learn how to perform statistical analysis on various inferential real life situations. Topics include: organizing data; descriptive statistics; probability; discrete distributions; normal distribution; sampling and sampling distributions; estimation; hypothesis testing; correlation and regression analysis.

Learning Outcomes

Upon successful completion of this module, students will be able to

1. Describe the role of statistical analysis in business.
2. Identify the types of data and the various summary measures used to describe data.
3. Describe data in tables and graphs.
4. Apply the binomial, Poisson and normal distributions as a model for data.
5. Apply confidence intervals and test hypotheses for population means and proportions.
6. Use correct data presentation and analysis methods based on problem type and data type.
7. Justify decisions based on statistical significance when faced with variability in data.
8. Analyze relationships between two continuous variables and determine valid prediction models using simple linear regression and correlation.

Alignment of Program and Module Intended Learning Outcomes

PILOs of Accounting Program	MILOs
1. Integrate the contemporary theories, principles of accounting and business disciplines relevant to general business practice.	1
2. Assess general business scenarios with mathematical and statistical skills.	1, 2, 3, 4, 5, 6, 7, 8
3. Apply critical thinking and logical analysis skills and techniques to solve business problems.	1, 2, 3, 4, 5, 6, 7, 8
4. Interpret and analyze accounting information for internal control, planning, performance evaluation, and coordination to continuously improve business process.	NA
5. Apply accounting or business software for business analysis.	NA
6. Develop queries to assess management information from database to improve efficiency and effectiveness.	NA
7. Synthesize the latest requirement of international accounting and auditing standards in preparing financial statements and auditing reports.	NA
8. Utilize appropriate written and spoken forms to communicate effectively with stakeholders in various cultural environment.	NA
9. Recommend an appropriate course of action by ethically examining the economic, environmental, political, legal and regulatory contexts of global business practice.	NA
10. Utilize the latest empirical findings and academic studies to support the recommendation of business projects.	NA

Content

Topics	Duration
1 The Nature of Statistics 1.1 Two Kinds of Statistics 1.2 Simple Random Sampling <i>(Describe various kinds of statistics and sampling methods.)</i>	1.5 hrs
2 Organizing Data 2.1 Variables and Data 2.2 Organizing Qualitative Data 2.3 Organizing Quantitative Data 2.4 Distribution Shapes <i>(Describe major ways to organize collected data.)</i>	3 hrs
3 Descriptive Measures 3.1 Measures of Center 3.2 Measures of Variation	4.5 hrs

	<p>3.4 The Five-Number Summary; Boxplots</p> <p>3.5 Descriptive Measures for Populations; Use of Samples</p> <p><i>(Describe several measurements used in statistics.)</i></p>	
4	<p>Probability Concepts</p> <p>4.1 Probability Basics</p> <p>4.2 Events</p> <p>4.3 Some Rules of Probability</p> <p>4.8 Counting Rules</p> <p><i>(Explain fundamental concepts of probability.)</i></p>	3 hrs
5	<p>Discrete Random Variables</p> <p>5.1 Discrete Random Variables and Probability Distributions</p> <p>5.2 The Mean and Standard Deviation of a Discrete Random Variable</p> <p>5.3 The Binomial Distribution</p> <p>5.4 The Poisson Distribution</p> <p><i>(Describe various kinds of discrete probability distributions.)</i></p>	3 hrs
6	<p>The Normal Distribution</p> <p>6.1 Introducing Normally Distributed Variables</p> <p>6.2 Areas under the Standard Normal Curve</p> <p>6.3 Working with Normally Distributed Variables</p> <p>6.4 Assessing Normality; Normal Probability Plots</p> <p>6.5 Normal Approximation to the Binomial Distribution</p> <p><i>(Identify the normal distribution.)</i></p>	4.5 hrs
7	<p>The Sampling Distribution of the Sample Mean</p> <p>7.1 Sampling Error; the Need for Sampling Distributions</p> <p>7.2 The Mean and Standard Deviation of the Sample Mean</p> <p>7.3 The Sampling Distribution of the Sample Mean</p> <p><i>(Identify the properties of sample mean and sampling distribution.)</i></p>	3 hrs
Test 1		1.5 hrs
8	<p>Confidence Intervals for one Population Mean</p> <p>8.1 Estimating a Population Mean</p> <p>8.2 Confidence Intervals for One Population Mean When σ is Known</p> <p>8.3 Confidence Intervals for One Population Mean When σ is Unknown</p> <p><i>(Apply the knowledge of sample mean and sampling distribution to construct confidence intervals for population mean.)</i></p>	3 hrs

9	Hypothesis Tests for One Population Mean 9.1 The Nature of Hypothesis Testing 9.2 Critical-Value Approach to Hypothesis Testing 9.3 P-Value Approach to Hypothesis Testing 9.4 Hypothesis Tests for One Population Mean When σ is Known 9.6 Hypothesis Tests for One Population Mean When σ is Unknown <i>(Apply the knowledge of sample mean and sampling distribution to test hypotheses for population mean.)</i>	4.5 hrs
10	Inferences for Two Population Means 10.1 The Sampling Distribution of the Difference between Two Sample Means for Independent Samples 10.3 Inferences for Two Population Means, Using Independent Samples: Standard Deviations Not Assumed Equal 10.5 Inferences for Two Population Means, Using Paired Samples <i>(Apply the knowledge of sample mean and sampling distribution to the two-population -means cases.)</i>	3 hrs
12	Inferences for Population Proportions 12.1 Confidence Intervals for One Population Proportion 12.2 Hypothesis Tests for One Population Proportion 12.3 Inferences for Two Population Proportions, Using Independent Samples <i>(Apply the knowledge of sample mean and sampling distribution to the population proportion cases.)</i>	3 hrs
Test 2		1.5 hrs
14	Descriptive Methods in Regression and Correlation 14.1 Linear Equations with One Independent Variable 14.2 The Regression Equation 14.3 The Coefficient of Determination 14.4 Linear Correlation <i>(Apply mathematical techniques to find regression equations and various coefficients in regression and correlation analyses.)</i>	3 hrs
Final Examination		3 hrs
		Total: 45 hrs

Teaching Method

This course is primarily conducted by means of class lectures on concepts of statistics. Classwork exercises / assignments and tests will be used to assess students' understanding of the course materials, as well as to monitor students' progress and commitment to the course.

TM1: Statistical knowledge is delivered primarily by lectures with the aid of powerpoint slides.

TM2: In-class discussion will be held to ensure students' understanding of the topics.

TM3: Classwork exercises / assignments will be given.

In order to achieve the outcomes of this course, students are expected to perform the following learning tasks:

- Read and prepare assigned materials before class.
- Review and work on exercises after class to evaluate understanding.
- Prepare for tests and final exam.
- Seek advice from instructor for difficulties encountered.
- Form study group to learn and practice skills.

Attendance

Attendance requirements are governed by the “Academic Regulations Governing Bachelor’s Degree Programmes of Macao Polytechnic Institute”. Students are not eligible to attend the final examination and re-sit examination; moreover, an “F” will be given as the final grade to students who have less than the stated attendance for the enrolled module.

Assessment

This module is graded on a 100 point scale, with 100 being the highest possible score and 50 the pass score.

	Activities used to assess students’ achievement of MILOS	Percentage
1.	Classwork exercises/assignments	20%
2.	Tests (2 midterm tests)	30%
3.	Final examination	50%
	Total percentage:	100%

Plagiarism Policy

When a student submits an assignment, he or she has a duty to ensure that his or her assignment has been checked by *Turnitin* software, and the similarity score given by *Turnitin* software cannot be higher than 30%. However, a special case can be determined by the instructor.

Teaching Material(s)

Textbook

Neil A. Weiss, 2016, *Introductory Statistics, Global Edition*, 10th edition, Pearson.