AP STATISTICS SYLLABUS

School Year	2025-2026
Subject	AP STATISTICS
Grade Level	Grade 11 & 12
Teacher	Mr. Edward Solis
Email	esolis@dishs.tp.edu.tw

COURSE DESCRIPTION:

Teaching Statistics provide students with a great simplicity in instruction and activities that is geared to a balance learning in school and at home. Students are gathered into small groups to develop their communication and mathematical skills. Essential classroom discussion related to the topics is also enhanced.

Teaching materials for the course come from textbooks, classroom lectures, newspapers, journals, medical newsletters, videos, and the internet. At the start of the school year, students receive a list of formulas and tables from the course description book. These handouts are used throughout the year for homework and tests. Students will have access to the computer lab for statistics computer tasks. Classroom is equipped with computer and smart board to assist teacher and student learning.

PROJECT:

Projects form a major part of the course. Student need to complete three to five projects each semester. Some of these projects are completed during class time, whereas others are completed outside of class. These projects require students to design surveys and experiments, gather data, analyze the data numerically and graphically, and apply inferential statistics to draw conclusions for a population. Students write formal reports on their projects using statistical language.

AP Statistics Survey Project

Introduction

AP Statistics has introduced you to the methods and procedures that allow us to explore four themes: Exploring Data, Sampling and Experimentation, Anticipating Patterns, and Statistical Inference. This project is designed to allow you to demonstrate your understanding of the connections between these themes as you carry out a statistical study. Your task is to identify a research question that interests you, design a study to collect data on that question, analyze the data and answer question using an appropriate form on inference.

Objectives

The purpose of this project is to allow you to communicate your understanding of the connections between the four themes of Statistics.

To present a final report that clearly indicates your understanding of data collection, analysis, and inference.

Project Outline

1. Identify a research question

   Phase 1 Team members brainstorm possible survey topics on issues of school interest
   Phase 2 Each team submits a typed proposal describing:
   - Topic/question of interest
   - Background motivation for selecting this topic/question
   - Questions to be included in the survey
   - Methodology
     - The type of sampling procedure do you intend to use – stratified, cluster, SRS or systematic
     - Precise description of your randomization, including labeling
     - When, where, and how you will administer the survey
2. Collect Data – Observational Study or Experiment
   Phase 3 Select your sample and administer your survey
3. Analyze Data – Graphically and Numerically
   Phase 4 Organize, summarize, and analyze your data
4. Perform Inference – Answer Research Question
   Phase 5 Prepare a written report that documents your survey
5. Present Findings
   Phase 6 Class Presentation – a ten minute opportunity to share the critical aspects of the survey project with your classmates. Make it interesting!

Project Expectations

1. Identify a research question
   - Identify a question that is interesting, appropriate, and worthy of investigation.
   - Your question must lend itself to data that can be analyzed using the methods learned in class.
   - You are expected to get your question approved prior to collecting data.
   - Form appropriate hypotheses to guide your investigation.
2. Collect Data – Observational Study or Experiment
   6. Data can come from three sources: A well-designed and carried out survey, observational study, or experiment.
   7. Your data collection procedure should accurately reflect the question being researched.
   8. A full, detailed description of the collection procedure should be included in your final report. Thoroughly describe the procedure in terms of the methodology learned.
   9. Organize raw data in a spreadsheet/document and include in an appendix in your final report.
3. Analyze Data – Graphically and Numerically
   - Analyze raw data using appropriate graphical and numerical procedures.
   - Describe Shape, Outliers, Center, and Spread of datasets in the context of your research question.
   - Include appropriate graphical displays and numeric summaries/descriptions in your final report.
   - Interpret the Exploratory Data Analysis in the context of your research question
4. Perform Inference – Answer Research Question
   - Form appropriate hypotheses to answer your research question.
   - Check appropriate conditions for your test of significance.
   - Show all applicable work: Sampling Distribution, Test Statistic Calculation, p-value, etc.
   - Answer your research question based on your inferential calculations.
5. Present Findings
   - You are expected to write up your findings in a final report. This report should follow a standard academic format and should include a section for each task noted above.

PRIMARY TEXTBOOKS AND OTHER RESOURCES:

1. AP Classroom (www.Collegeboard.org)
2. AP College Board Exam FRQs and MCQs
3. **STATS: Modeling the World** by Bock, Bullard, Velleman & De Veaux: copyright 2020

GRADING SYSTEM/ASSESSMENT:

Grading Criteria:

The quarterly grade will be awarded for all student work based on the following criteria:

- ✓ **Class participation and Seatwork** - 3/10 of quarterly grade
- ✓ **Major Projects, Quizzes and Tests**- 3/10 of quarterly grade
- ✓ **Quarterly Exams**- 3/10 of quarterly grade
- ✓ **Deportment** - 1/10 of quarterly grade

Student Materials Required:

- The students will need to bring notebook to write their works and lecture
- The students must bring the prescribed calculator and a measuring device like ruler for making graphs

Classroom Expectations:

1. Be on time to class; be seated **before** the bell rings.
2. Wear your uniform neatly.
3. Use English at all times.
4. Come prepared with books, assignments, and supplies and without gum, food or drink (a sealable water bottle is okay).
5. Be respectful of others (especially when speaking), and of school property.
6. Do your best and participate.
7. Ask permission before leaving the class; take hall pass.
8. Wait for the bell to ring before you leave class.

Homeworm/Seatwork rules

1. The students may NOT copy from classmates
2. The students are allowed to help each other verbally.
3. The students are NOT allowed to do the work, partially or entirely, for other students.

Discipline:

1. Verbal warning, second reminder (if needed)
2. Write-Up and then referral to the Discipline Office.

3. Parent-Teacher conference.

Sample Activity

Activity

1. Dean's office at Hendrix College gave the following information about numbers of majors in different academic areas: Humanities, 372; Natural Sciences, 415; Social Science, 511; Business Administration, 619; Philosophy, 196. Make a Pareto chart representing this information.
2. Professor Hill in the Music Department kept a list of the number of students visiting his office each week for two semesters (30weeks). The results were

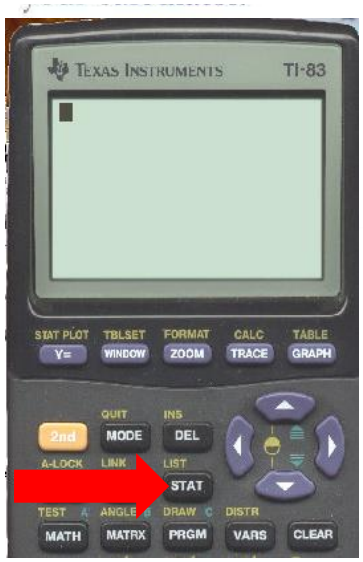
15	23	17	13	3	9	7	6	8	11
16	32	27	4	20	3	28	5	6	11
20	12	8	10	25	10	8	15	11	9

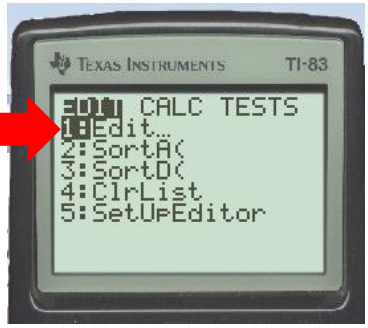
   (a) Make a frequency table with five classes, showing class boundaries, class midpoints, frequencies, relative frequencies, and cumulative frequencies.
   (b) Draw a frequency histogram from the information in part (a)
   (c) Draw a relative-frequency histogram from the information in part (a)
   (d) Draw an ogive from the information in part (a)
3. Jim is a taxi driver who keeps a record of his meter readings. The results for the past 20 meter readings (rounded to the nearest dollar) are given below.

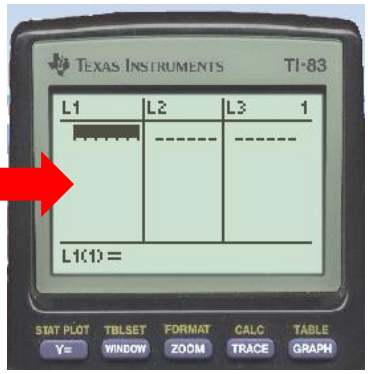
15	7	9	21	19	17	8	35	22	33
46	5	24	37	51	49	57	42	12	16

   Make a stem-and leaf display of the data.

Sample use of Calculator







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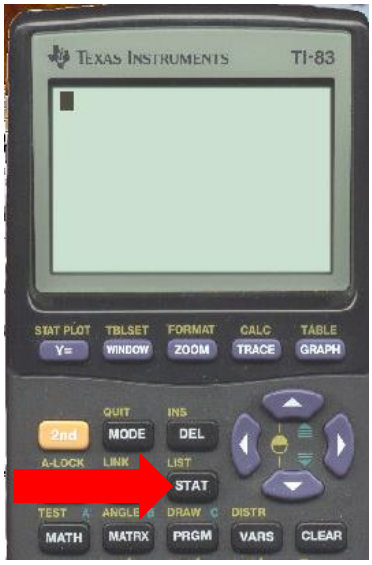
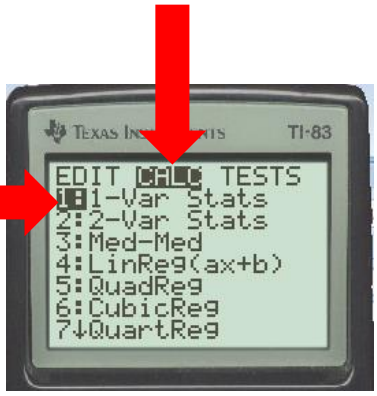
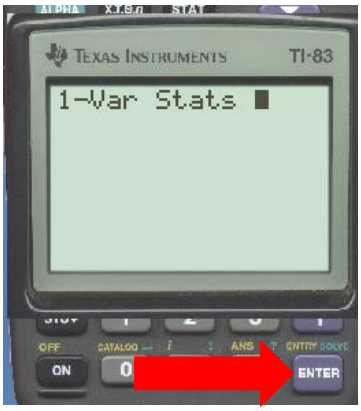
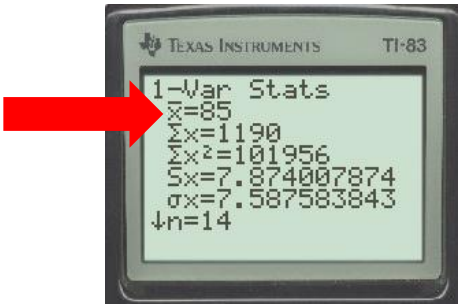




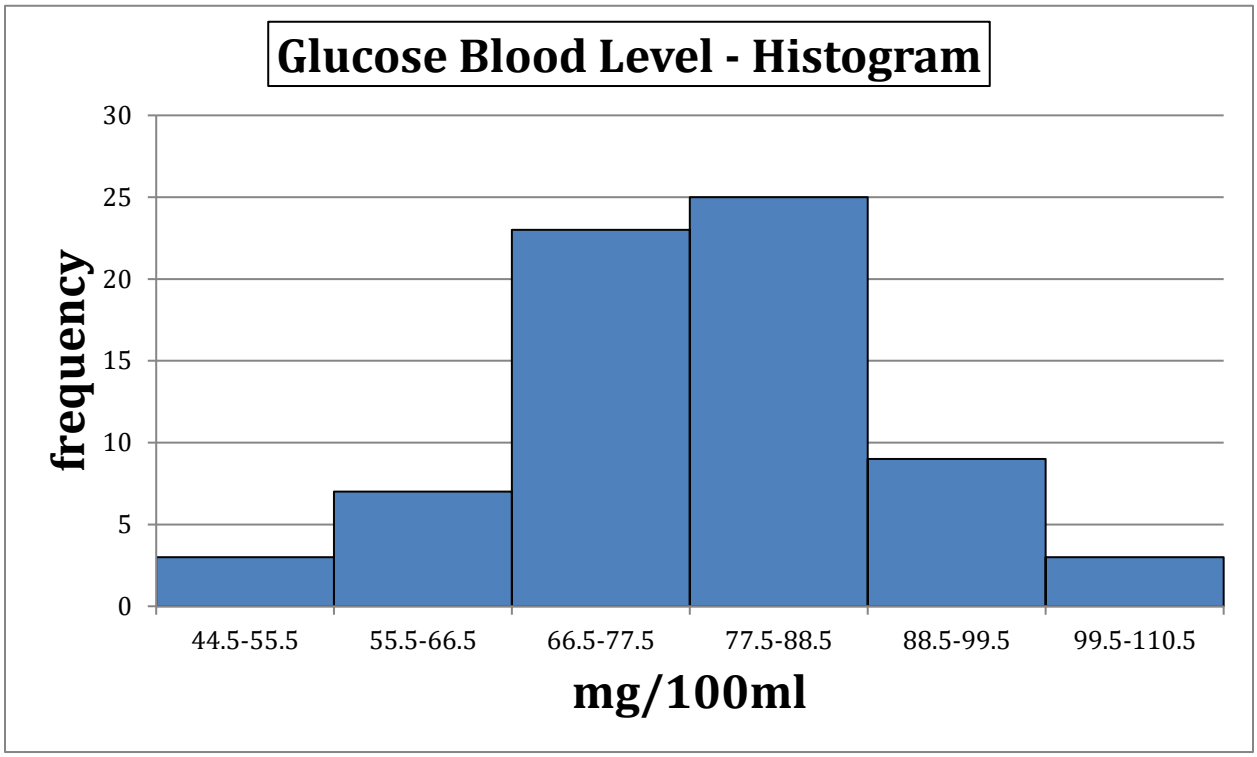


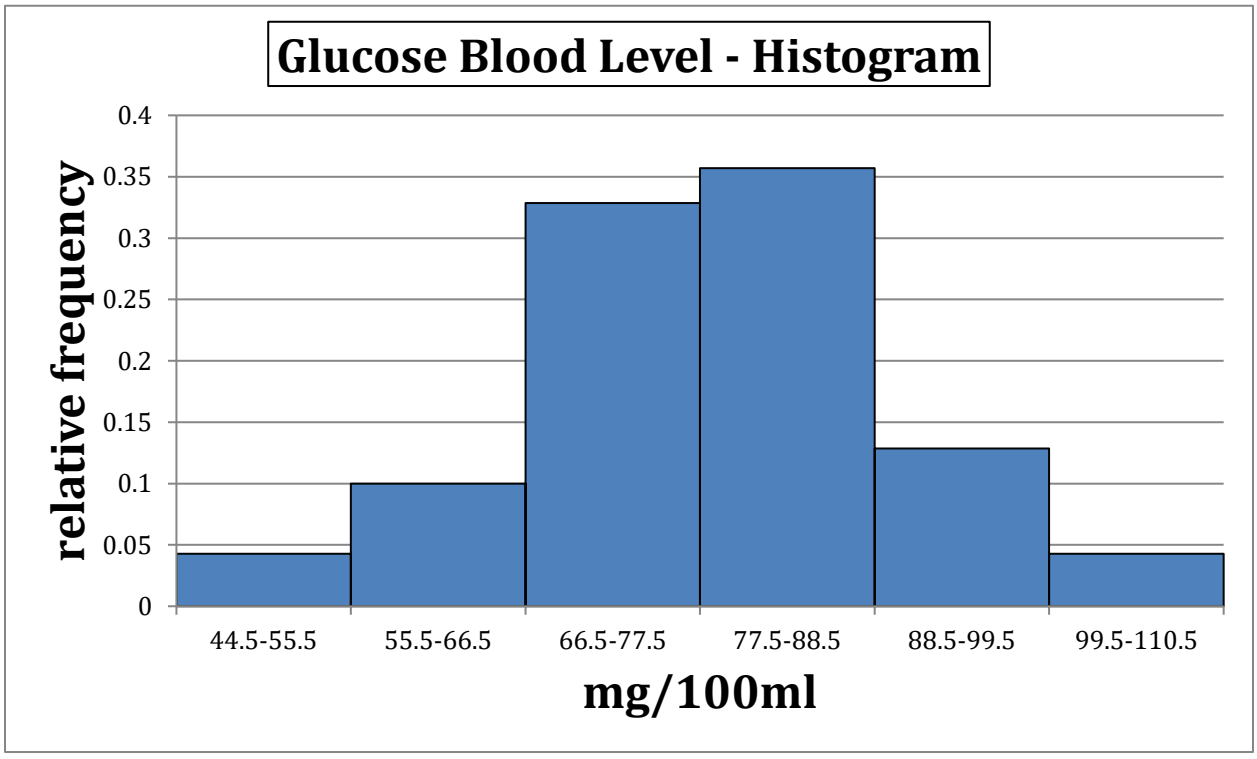


Sample use of Computer Software (MS Excel)

Class	Class		Tally
#	Lower limit	Upper limit	
1	45	55	𝍸
2	56	66	𝍸 ||
3	67	77	𝍸 𝍸 𝍸 𝍸 |||
4	78	88	𝍸 𝍸 𝍸 𝍸 𝍸
5	89	99	𝍸 ||||
6	100	110	|||

Class	Class		Frequency	Relative frequency	Class Boundaries		Cumulative Frequency
#	Lower limit	Upper limit	f	f/n	Lower	Upper	
1	45	55	3	$\frac{3}{70} = 0.0429$	44.5	55.5	3
2	56	66	7	$\frac{7}{70} = 0.1000$	55.5	66.5	10
3	67	77	23	$\frac{23}{70} = 0.3286$	66.5	77.5	33
4	78	88	25	$\frac{25}{70} = 0.3571$	77.5	88.5	58
5	89	99	9	$\frac{9}{70} = 0.1286$	88.5	99.5	67
6	100	110	3	$\frac{3}{70} = 0.0429$	99.5	110.5	70
			N=70	$\frac{70}{70} = 100.00$			


Glucose Blood Level - Histogram
frequency
30
25
20
15
10
5
0
44.5-55.5
55.5-66.5
66.5-77.5
77.5-88.5
88.5-99.5
99.5-110.5
mg/100ml


Glucose Blood Level - Histogram
relative frequency
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
44.5-55.5
55.5-66.5
66.5-77.5
77.5-88.5
88.5-99.5
99.5-110.5
mg/100ml

Dominican International School
台北市私立道明外僑學校
No. 76, Dazhi Street, Taipei (104042), Taiwan, R.O.C.
10464 臺北市中山區大直街 76 號

SYLLABUS

1st Semester

Topic	Week	Description
Unit 1 Exploring One-Variable Data	1-4	1.1 Introducing Statistics
		1.2 The Language of Variation: Variables
		1.3 Representing a Categorical Variable with Tables
		1.4 Representing a Categorical Variable with Graphs
		1.5 Representing a Quantitative Variable with Graphs
		1.6 Describing the Distribution of a Quantitative Variable
		1.7 Summary Statistics for a Quantitative Variable
		1.8 Graphical Representations of a Summary Statistics
		1.9 Comparing Distributions of a Quantitative Variable
		1.10 The Normal Distribution
Unit 2 Exploring Two-Variable Data	5 - 7	2.1 Introducing Statistics: Are Variables Related?
		2.2 Representing Two Categorical Variabls
		2.3 Statistics for Two Categorical Variables
		2.4 Representing the Relationship Between Two Quantitative Variables
		2.5 Correlation
		2.6 Linear Regression Models
		2.7 Residuals
		2.8 Least Squares Regression
		2.9 Analyzing Departures from Linearity
Unit 3 Collecting Data	9 -10	3.1 Introducing Statistics: Do the Data We Collected Tell the Truth?
		3.2 Introduction to Planning a Study
		3.3 Random Sampling and Data Collection
		3.4 Potential Problems with Sampling
		3.5 Introduction to Experimental Design
		3.6 Selecting an Experimental Design

		3.7 Inference and Experiments
Unit 4 Probability, Random Variables, and Probability Distributions	11-14	4.1 Introducing Statistics: Random and Non-random patterns?
		4.2 Estimating Probabilities Using Simulation
		4.3 Introduction to Probability
		4.4 Mutually Exclusive Events
		4.5 Conditional Probability
		4.6 Independent Events and Unions of Events
		4.7 Introduction to random Variables and Probability Distributions
		4.8 Mean and Standard Deviation of Random Variables
		4.9 Combining Random Variables
		4.10 Introduction to the Binomial Distribution
		4.11 Parameters for a Binomial Distribution
		4.12 The Geometric Distribution
Unit 5 Sampling Distribution	15-17	5.1 Introducing Statistics: Why is My Sample Not Like yours?
		5.2 The Normal Distribution, Revisited
		5.3 The Central Limit Theorem
		5.4 Biased and Unbiased Point Estimates
		5.5 Sampling Distributions for Sample Proportions
		5.6 Sampling Distributions for Differences in Sample Proportions
		5.7 Sampling Distributions for Sample Means
		5.8 Sampling Distributions for Differences in Sample Means

2nd Semester

Topic	Week	Description
Unit 6 inference for Categorical Data: Proportions	19-22	6.1 Introducing Statistics: Why Be Normal?

		6.2 Constructing a Confidence Interval for a Population Proportion
		6.3 Justifying a Claim Based on a Confidence Interval for a Population Proportion
		6.4 Setting Up a Test for a Population Proportion
		6.5 Interpreting p-value
		6.6 Concluding a Test for a Population Proportion
		6.7 Potential Errors When Performing Tests
		6.8 Confidence Intervals for the Difference of Two Populations
		6.9 Justifying a Claim Based on a Confidence Interval for a Difference of Population Proportions
		6.10 Setting Up a Test for the Difference of Two Population Proportions
		6.11 Carrying Out a Test for the Difference of Two Population Proportions
Unit 7 Inference for Categorical Data: Means	23-26	7.1 Introducing Statistics: Should I Worry About Errors?
		7.2 Constructing a Confidence Interval for a population Mean
		7.3 Justifying a Claim About a Population Mean Based on a Confidence Interval
		7.4 Setting Up a Test for a Population Mean
		7.5 Carrying Out a Test for a Population Mean
		7.6 Confidence Intervals for the Difference of Two Means
		7.7 Justifying a Claim About the Difference of Two Means Based on Confidence Interval
		7.8 Setting Up a Test for the Difference of Two population Means
		7.9 Carrying out a Test for the Difference of Two population Means
Unit 8 Inference for Categorical Data: Chi-Square	27-28	8.1 Introducing Statistics: Are My Results Unexpected?
		8.2 Setting Up a Chi-Square Goodness of Fit Test
		8.3 Carrying Out a Chi-Square Goodness of Fit Test
		8.4 Expected Counts in Two-Way Tables

		8.5 Setting Up a Chi-Square Test for Homogeneity or independence
		8.6 Carrying out a Chi-Square Test for Homogeneity or independence
Unit 9 Inference for Qualitative Data: Slopes	29-30	9.1 Introducing Statistics: Do Those Points Align?
		9.2 Confidence intervals for the Slope of a Regression Model
		9.3 Justifying a Claim About the Slope of a Regression Model Based on a confidence interval
		9.4 Setting Up a Test for the Slope of a Regression Model
		9.5 Carrying Out a Test for a Slope of a Regression Model
	31-36	AP Exam Review