



**MATH 232 - Statistics  
Proposal Last Revised - 4/23/2009**

**Napa Valley College**

**SECTION A****1. Unique ID Number:**

(To be entered by the Pre-Curriculum Review Office Only.)

**2. Discipline/s:**

Mathematics

**3. Division:**

Science, Mathematics and Engineering

**4. Subject Area:**

Mathematics

**5. Subject Code:**

MATH

**6. Course Number:**

232

**7. Course Title:**

Statistics

**8. Semester of First Offering:**

Fall

2009

**9. Rationale for adding this course to the curriculum:**

a. What is the rationale for offering this course? How will this course meet student and community needs and improve the college curriculum?

To be consistent with neighboring institutions and to add a computer lab element to the class. To emphasize the common utilization of statistics, which is by computer.

b. How does this course differ from other courses with similar content?

N/A

**10. Units:**

4.0

**Variable Units:**

n/a

(\*One Unit for every 18 hours of lecture (+36 hrs work outside of class), 36 hours of integrated Lab (+18 hrs outside of class), or 54 hours of Lab.

**11. This Course is:**

Associate Degree Applicable - UC transferable

**12. Cross List:**

N/A

**Course Format and Duration****13. Total Instructional Hours:**

Lecture: 54

Lab: 18

Integrated Lab:

**Total Hours** 72**14. Hours per week in outside of class assignments: 6****15. Open Entry/Open Exit:**Yes  No

<b>SECTION B</b>	
<b>General Education Information:</b>	
<p><b>1. College Associate Degree GE Applicability:</b></p> <p>D.2.A - Mathematics for AS  D.2.B - Mathematics for AA  D.3 - Communication and Analytical Thinking</p>	
<p><b>2. CSU GE Applicability (Recommended-requires CSU approval):</b></p> <p>B-4 Mathematics/Quantitative Reasoning</p>	
<p><b>3. IGETC Applicability (Recommended-requires CSU/UC approval):</b></p> <p>2 - Mathematical Concepts</p>	

<b>SECTION C</b>	
<b>Course Description</b>	
<p><b>1. Repeatability:</b>      <a href="#">Not Repeatable</a></p>	
<p><input type="checkbox"/> Skills or proficiencies are enhanced by supervised repetition and practice within class periods.</p> <p><input type="checkbox"/> Active participatory experience in individual study or group assignments is the basic means by which learning objectives are attained.</p>	

Course content differs each time it is offered.

## 2. Catalog Description

An introduction to statistical concepts. Topics include summary statistics, discrete and continuous distributions, probability, confidence intervals, hypothesis testing, linear regression, Chi-square and computer applications.

### SECTION D

#### Condition on Enrollment – ( )

**1a. Prerequisite(s):** (Course and/or other preparation/experience that is REQUIRED to be completed previous to enrollment in this course.)

[MATH 94 - Intermediate Algebra](#), or [Math 99 - Intermediate Algebra part B](#)

**1b. Co-requisite(s):** (Courses and/or other preparation that is REQUIRED to be taken concurrently with this course.)

None.

**1c. Recommended:** (Minimum preparation RECOMMENDED in order to be successful in this course. Also known as "Course Advisory".)

[English 90](#)

### SECTION E

#### Course Outline Information

##### 1. Student Learning Outcomes:

**Calculate, graph and interpret descriptive statistics. Calculate probabilities using fundamental properties of probability and probability distributions. Analyze and interpret data using regression, confidence intervals and hypothesis tests.**

**2. Course Objectives:** Upon completion of this course, the student will be able to:

Compute and compare descriptive statistics.

Construct and analyze statistical graphs using computer software.

Calculate probabilities using laws of probability and discrete and continuous probability distributions.

Estimate parameters with confidence intervals using one and two samples.

Perform hypothesis tests using one and two samples.

Create and apply regression models based on experimental data.

Evaluate published statistical results in the media.

Apply computer software to all the above.

**3. Course Content:** (Provides a comprehensive, sequential outline of the course content, including all major subject matter and the specific body of knowledge covered.)

1. Organization of Data
  - a. Statistical graphs
  - b. Frequency distributions
  - c. Sampling
2. Descriptive Statistics
  - a. Measures of central tendency
  - b. Measures of variation
  - c. Measures of position
3. Probability
4. The Binomial Distribution
5. The Normal Distribution
  - a. The distribution of  $\bar{x}$
6. Confidence Intervals
  - a. For a population mean,  $\sigma$  known
  - b. For a population mean,  $\sigma$  unknown
  - c. For a population proportion
7. Hypothesis Tests
  - a. For a population mean,  $\sigma$  known
  - b. For a population mean,  $\sigma$  unknown
  - c. For a population proportion
8. Repeat 6 and 7 for two samples
9. Regression and Correlation
10. The Chi-Square Distribution

**4. Methods of Instruction:**

Classroom instruction, including but not limited to lecture, example problems from the text calculated by hand, computer and/or calculator, group activities such as worksheets, student projects. Hybrid instruction includes (above) with emphasis on calculator/computer applications.

Online instruction includes web-based lecture, individual activities/projects with emphasis on computer applications.

**5. Methods of Evaluation:** Describe the general types of evaluations for this course and provide at least two, specific examples.

- . Homework (example: Complete exercises 5-49 odd from section 7.2 in the text.)
- . Quizzes (example: IQ scores are normally distributed with a mean of 100 and a standard deviation of 19. 1) A student is selected at random. Find the probability that the student's IQ is between 95 and 120. 2) Ten students are selected at random. Find the probability that their mean IQ is between 95 and 120.)
- . Chapter exams
- . Lab assignments
- . Final examination

**6. Minimal Standards for Passing:**

Completion of all assignments and examinations at 60% level to earn a grade of "D"

**7. Assignments:** State the general types of assignments for this course under the following categories and provide at least two specific examples for each section.

**a. Reading Assignments:**

Textbook (example: Read section 6.2 before our next class and be ready to discuss example 3 on page 302.)

Lab manual (example: Read the procedure of how to graph a pie chart on page 54 before our next lab and come prepared to graph pie charts on the computer.)

**b. Writing, Problem Solving or Performance:**

Homework (example: Complete exercises 5-49 odd from section 7.2 in the text.)

Lab assignments

**c. Other** (Terms projects, research papers, portfolios, etc.)

**8. Required Materials:****a. EXAMPLES of typical college-level textbooks (for degree-applicable courses) or other print materials.**Book 1:

Author: Triola, Mario  
Title: Elementary Statistics  
Publisher: Pearson/Addison Wesley  
Date of Publication: 2006  
Edition: 8th

Book 2:

Author: Sullivan, Michael III  
Title: Fundamentals of Statistics  
Publisher: Pearson/Prentice Hall  
Date of Publication: 2008  
Edition: 2nd

Book 3:

Author:  
Title:  
Publisher:  
Date of Publication:  
Edition:

Book 4:

Author:  
Title:  
Publisher:  
Date of Publication:  
Edition:

Book 5:

Author:  
 Title:  
 Publisher:  
 Date of  
 Publication:  
 Edition:

**b. Other materials and/or supplies required of students:**

**The textbook will be bound with a student version of Minitab statistical software.**

**SECTION F**

**Resources:**

**1. Library:** Please identify any additional library materials that are required for this course (reference books, circulating books, periodicals, computer software, A-V media, A-V equipment.)

None.

**2. Computer Support Services:** Please identify the implications to Computer Support Services:

The class will need access to computers for approximately 35 students per section.

**3. Learning Skills and Testing Center:** What are the implications to the Learning Skills and Testing Center?

None.

**SECTION G**

**1. Facilities:**

Briefly describe teaching facilities needed including classroom, lab, multi-media, etc. Include detailed information on any new facilities that this course will require:

Classroom and computer lab for one hour per week per class.

**2. Equipment:**

List new or existing equipment, teaching aids, etc., that will be required for this course. Estimate costs and provide information on funding sources if new equipment is needed.

Computer.

**3. Expendable Supplies:**

Will additional funding sources be needed to provide supplies for this course?

No.

**SECTION H (TO BE COMPLETED BY ARTICULATION OFFICE ONLY!)**

**Articulation Information:** (Required for Transferable courses only)

1.

- CSU transferable.
- UC transferable.

2. CAN: [STAT 2](#)**SECTION I****1. Program Information:**

- In an approved program.
- Part of a new program.
- Not part of an approved program.

**If you selected the first or second option above, you must provide local program TOP code information:**

Program title - TOP Code: [N/A- 000000](#)**2. SAM Code:**

- A – Apprentice
- B – Advanced Occupational
- C – Clearly Occupational
- D – Possibly Occupational
- E – Non-occupational

**3. Classification:**

- Degree credit
- Non-degree credit
- Non-credit

**Form A**



CONDITION ON ENROLLMENT		
<p><b>1 What is the condition on enrollment?</b></p> <p>Course: <b>Math 94 or Math 99</b></p> <p>If it is not a course (an assessment test, team tryout, audition, Health and Safety requirement) then list it in this text box</p>		
<b>2 The condition on enrollment is a:</b>	<input checked="" type="checkbox"/>	Prerequisite
	<input type="checkbox"/>	Co-requisite
	<input type="checkbox"/>	Recommended Preparation
	<input type="checkbox"/>	Limitation on Enrollment
<b>3 The condition of enrollment is being:</b>	<input type="checkbox"/>	Established
	<input type="checkbox"/>	Revised
	<input checked="" type="checkbox"/>	Renewed
	<input type="checkbox"/>	Deleted
<b>4 Scrutiny used:</b>	<input checked="" type="checkbox"/>	Advisory – Complete #5 Content Review
	<input type="checkbox"/>	Sequential Series of Courses – Complete #5, <u>Content Review</u> (The content review must demonstrate the appropriate match between the exit skills of this course) and #6, <u>Sequential Series Course Review</u>
	<input type="checkbox"/>	Equivalent UC/CSU requirement – Complete #5, <u>Content Review</u> and #7, <u>Equivalent CSU/UC Review</u>
	<input type="checkbox"/>	Health and Safety Requirements – Complete #5, <u>Content Review</u> and #8, Health and Safety Justification
	<input type="checkbox"/>	Required Statute or Regulation – Complete #5, <u>Content Review</u> and #8, <u>Required Statute or Regulation</u>
	<input type="checkbox"/>	Assessment Process – Complete #5, <u>Content Review</u> and #9, <u>Data Collection and Analysis</u>
	<input type="checkbox"/>	Course out of Discipline that is English or Math – Complete #5, <u>Content Review</u> and #9, <u>Data Collection and Analysis</u>
	<input type="checkbox"/>	Linked Courses for a Special Student Cohort – Complete #5, <u>Content Review</u> and #10.A, <u>Limitation on Enrollment</u>

	<input type="checkbox"/>	Honors Course – Complete #5, <u>Content Review</u> and #10.B, <u>Limitation on Enrollment</u>	
	<input type="checkbox"/>	Performance Based – Complete #5, <u>Content Review</u> and #10.B, <u>Limitation on Enrollment</u>	
<b>5 Content Review (Required for all Conditions of Enrollment)</b>			
<p>List the Entrance skills (skills, knowledge, and/or abilities) which are deemed necessary at entry or concurrent</p> <ol style="list-style-type: none"> <li>1. Perform arithmetic operations using integers, rationales, and elementary polynomials</li> <li>2. Manipulate exponential expressions</li> <li>3. Solve linear equations and inequalities</li> <li>4. Solve elementary word problems which translate to linear/quadratic equations</li> <li>5. Graph linear equations; write "Slope/Intercept" form of equations of lines</li> <li>6. Use of roots, exponentials on calculator</li> </ol> <p>List the exit skills (skills, knowledge, and/or abilities) that a student will learn that are essential to successful completion of this course and will be built upon in this course</p> <ol style="list-style-type: none"> <li>1. Perform arithmetic operations using integers, rationales, and elementary polynomials</li> <li>2. Manipulate exponential expressions</li> <li>3. Solve linear equations and inequalities</li> <li>4. Solve elementary word problems which translate to linear/quadratic equations</li> <li>5. Graph linear equations; write "Slope/Intercept" form of equations of lines</li> <li>6. Perform linear estimations</li> <li>7. Use of roots, exponentials on calculator</li> </ol>			
<b>6 Sequential Series Course Review</b>			
The No. and Title of the course that requires the prerequisite			
The No. and Title of the requisite course			
<b>7 Equivalent UC/CSU Course Review – List 3 CSU or UC campuses</b>			
	UC or CSU Campus	Equivalent Course at UC/CSU	Requisite Course at UC/CSU
<b>1</b>			
<b>2</b>			
<b>3</b>			
<b>8 Health and Safety or Required Statute or Regulation Justification</b>			

9 Data Collection and Analysis (Summarize the results of the research here and provide a location where a complete description of the study may be viewed)

10 Limitation on Enrollment

A. Linked or Honors Courses for Special Student Cohort

Describe the Special Student Cohort and Identify the courses or sections to be linked:

Do any of these courses satisfy any certificate or associates degree requirement?

- Yes  
 No

If "Yes" List the courses and the certificate and/or associate degree requirements it meets:

If "No" List other courses or sections of the same course being offered which satisfy the same requirement:

**B. Performance Course**

Was a disproportionate impact study conducted for this course?

- Yes  
 No

If "Yes", describe the results of the study:

If "No", explain when the study will be conducted:

Does this course satisfy any certificate or associates degree requirement?

- Yes  
 No

If "Yes" List the courses and the certificate and/or associate degree requirements it meets:

If "No" List other courses or sections of the same course being offered which satisfy the same requirement:

**Form A**

<b>CONDITION ON ENROLLMENT</b>	
<p><b>1 What is the condition on enrollment?</b></p> <p>Course: <b>English 90</b></p> <p>If it is not a course (an assessment test, team tryout, audition, Health and Safety requirement) then list it in this text box</p>	
<b>2 The condition on enrollment is a:</b>	<input type="checkbox"/> Prerequisite <input type="checkbox"/> Co-requisite <input checked="" type="checkbox"/> Recommended Preparation <input type="checkbox"/> Limitation on Enrollment
<b>3 The condition of enrollment is being:</b>	<input checked="" type="checkbox"/> Established <input type="checkbox"/> Revised <input type="checkbox"/> Renewed <input type="checkbox"/> Deleted
<b>4 Scrutiny used:</b>	<input checked="" type="checkbox"/> Advisory – Complete #5 Content Review <input type="checkbox"/> Sequential Series of Courses – Complete #5, <u>Content Review</u> (The content review must demonstrate the appropriate match between the exit skills of this course) and #6, <u>Sequential Series Course Review</u> <input type="checkbox"/> Equivalent UC/CSU requirement – Complete #5, <u>Content Review</u> and #7, <u>Equivalent CSU/UC Review</u> <input type="checkbox"/> Health and Safety Requirements – Complete #5, <u>Content Review</u> and #8, <u>Health and Safety Justification</u> <input type="checkbox"/> Required Statute or Regulation – Complete #5, <u>Content Review</u> and #8, <u>Required Statute or Regulation</u> <input type="checkbox"/> Assessment Process – Complete #5, <u>Content Review</u> and #9, <u>Data Collection and Analysis</u> <input type="checkbox"/> Course out of Discipline that is English or Math – Complete #5, <u>Content Review</u> and #9, <u>Data Collection and Analysis</u> <input type="checkbox"/> Linked Courses for a Special Student Cohort – Complete #5, <u>Content Review</u> and #10.A, <u>Limitation on Enrollment</u>

	<input type="checkbox"/>	Honors Course – Complete #5, <u>Content Review</u> and #10.B, <u>Limitation on Enrollment</u>																
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<p><b>5 Content Review (Required for all Conditions of Enrollment)</b></p> <p>List the Entrance skills (skills, knowledge, and/or abilities) which are deemed necessary at entry or concurrent</p> <p style="padding-left: 40px;">Ability to read critically and to write logical, informative sentences.</p> <p>List the exit skills (skills, knowledge, and/or abilities) that a student will learn that are essential to successful completion of this course and will be built upon in this course</p> <p style="padding-left: 40px;">Ability to read/decipher/analyze statistical information and to report those findings using the written word.</p>																		
<p><b>6 Sequential Series Course Review</b></p> <p>The No. and Title of the course that requires the prerequisite</p> <p>The No. and Title of the requisite course</p>																		
<p><b>7 Equivalent UC/CSU Course Review – List 3 CSU or UC campuses</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;"></th> <th style="width: 40%;">UC or CSU Campus</th> <th style="width: 30%;">Equivalent Course at UC/CSU</th> <th style="width: 25%;">Requisite Course at UC/CSU</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><b>1</b></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;"><b>2</b></td> <td></td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;"><b>3</b></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				UC or CSU Campus	Equivalent Course at UC/CSU	Requisite Course at UC/CSU	<b>1</b>				<b>2</b>				<b>3</b>			
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<p><b>10 Limitation on Enrollment</b></p> <p><u>A. Linked or Honors Courses for Special Student Cohort</u></p> <p>Describe the Special Student Cohort and Identify the courses or sections to be linked:</p> <p>Do any of these courses satisfy any certificate or associates degree requirement?</p> <p style="padding-left: 40px;"><input type="checkbox"/> Yes</p>																		

No

If "Yes" List the courses and the certificate and/or associate degree requirements it meets:

If "No" List other courses or sections of the same course being offered which satisfy the same requirement:

**B. Performance Course**

Was a disproportionate impact study conducted for this course?

Yes  
 No

If "Yes", describe the results of the study:

If "No", explain when the study will be conducted:

Does this course satisfy any certificate or associates degree requirement?

Yes  
 No

If "Yes" List the courses and the certificate and/or associate degree requirements it meets:

If "No" List other courses or sections of the same course being offered which satisfy the same requirement:

**Form D  
DISTANCE LEARNING COURSE OUTLINE SUPPLEMENT**

<b>Course:</b> MATH 232	<b>Course Title:</b> Math 232
<input checked="" type="checkbox"/> Hybrid	<input checked="" type="checkbox"/> Distance Education
<p>If any portion of the instruction in a proposed or existing course or course section is designed to be provided through distance education in lieu of face-to-face interaction between instructor and student, the course shall be separately reviewed and approved according to the district's adopted course approval procedures. [Title V &amp; 55206]</p>	
<b>Address the following questions:</b>	
<b>A. Need/Justification</b>	
<p>1. What is the intent in offering the course by distance education?  <b>To provide alternatives for students who might not otherwise be able to achieve their educational objectives.</b>  <b>To increase the number of mathematics classes offered online.</b>  <b>To provide a segway for students who are taking or have taken their beginning/intermediate algebra classes online.</b></p>	

**To encourage/promote technology competence by both student and instructor.**

**To offer a transferable math course online.**

2. How will learning be enhanced by the use of distance education technology?

**The field of Statistics has drastically changed with computers. Computer-generated statistical applications are continually being added to the toolbox that is statistical method. Virtually no one applies statistics by hand; it is all done by computer in the real world. Letting a computer do the calculations allows the student to figure out which procedure is appropriate and why, and what the results mean. Almost every student will need to apply statistics in some way in their field of study.**

## **B. Methods of Instruction: Instructor-Student Contact.**

### **Regular Effective Contact**

Contact with the instructor is to have four forms. Please indicate the type and number of instructor-student contacts per semester.

#### a. E-Mail Communication:

Individual	<b>12-18</b>
Chatroom	<b>0-18</b>
Bulletin Board	<b>0-18</b>
Listserve	
FAQs	

#### b. Telephone Contacts **5-8**

#### c. Orientation Sessions (in Person)

#### d. Group Meetings (In Person) **0-18**

#### e. Review Sessions (In Person)

#### f. Other (Describe)

Describe why you feel these forms of contacts will be effective:

**Many students, especially our younger students are extremely technology savvy and would prefer learning by computer. These students gain most of their information by internet, texting and other types of technology and will be very comfortable in the online format.**

Describe how you will identify and respond to students experiencing difficulty:

Students with low homework, quiz and/or test scores can be immediately identified and supported. Students can be referred to the MyStatLab online program for teaching videos, practice questions, and 24-hour support by email and phone. There are also many math support websites online that may be utilized.

## **2. Hours for Content Delivery and Interaction.**

Please show the approximate hours anticipated for student activities.

**72 hours/student/semester**

## **3. Assignments: Describe Student Assignments.**

**Textbook reading assignments (also available online).**  
**MyStatLab homework, quizzes and exams.**  
**Minitab lab assignments.**  
**Chat room/blackboard participation.**

For this course what are the total hours of work expected of the student beyond the hours of Content Delivery and Interaction?

144 hours

**4. Methods of Evaluation: Describe how you will evaluate students.**

Online homework, quizzes and exams.  
Lab projects/assignments.

**5. Technical Support: What equipment and staff are necessary to support the course (for students and faculty)? Is it already available?**

**A computer lab and computer support are necessary to support the course. It is available.**

**6. Instructional Materials and Resources: Describe how you will provide students with access to instructional materials and resources**

**The student will purchase a textbook bound with MyStatLab and Minitab statistical software. All other resources will be online.**

**7. Student Services**

Describe how you will provide students with access to admissions, registration, counseling and financial aid services.

**Students can e-mail or telephone to request an application, or they may apply online.**

**Students taking only online classes may mail or fax the registration form. The form can be downloaded from the schedule information on the college website.**

**Counseling services will be available by e-mail.**

**The financial aid application is online. Complete information about types of aid available and phone numbers/e-mail addresses for NVC's financial aid office can be found on the college website; [www.napavalley.edu](http://www.napavalley.edu).**

Accommodations for students with disabilities. Describe how you will accommodate students with disabilities.

**Courses will be checked through BOBBY, or a similar program, that is a comprehensive web accessibility software tool designed to help expose and repair barriers to accessibility and encourage compliance with existing accessibility guidelines**

**8. Additional Resources: Are additional resources/or secretarial support needed or anticipated to teach by distance learning?**

**No.**



**9. Course Size: What is the maximum number of students anticipated for this course?**

**35**

Free elementary statistics tutorials including interactive tutorials using applets as well as analytical tutorials on counting principles and probabilities. Probability and statistics problems are also included. Statistics Tutorials. Introduction to Statistics . Quartiles and Box Plot Definiton and computation of quartiles with Examples and detailed solutions. Properties of the Normal Distribution Curve An interactive tutorial using an applet to explore the effects of the mean and standard deviation on the graph of a normal distribution. Elementary statistics books may do more harm than good. They often brush difficulties under the rug. They avoid mathematical and philosophical details. (And it is, for many statisticians. But that's a topic for another time.) If a statistics book doesn't have fairly steep prerequisites, it will be hard for it not to be misleading. This leads to another frequently asked question: Do I intend to write my own elementary statistics book? No. I don't know whether I could write such a book that I'd be proud of.