

**UNIVERSITY COLLEGE OF THE FRASER VALLEY**

**COURSE INFORMATION**

**DISCIPLINE/DEPARTMENT:** Mathematics and Statistics      **IMPLEMENTATION DATE:** May 1990

**Course Revised Implementation Date:** September 1999

<u>Math 106</u>	<u>Statistics I</u>	<u>4</u>
<b>SUBJECT/NUMBER OF COURSE</b>	<b>DESCRIPTIVE TITLE</b>	<b>UCFV CREDITS</b>

**CALENDAR DESCRIPTION:**

An introduction to descriptive statistics, sampling, probability, estimates, hypothesis testing, correlation and regression, and analysis of variance. This course is similar to Math 104 but involves more probability and inferential statistics. Applications are stressed more than theory, but facility with Grade 12 level algebra is expected. No calculus is required.

This course is intended for commerce and biology students. Anyone without Math 12 or an equivalent must take Math 104. Students should check the requirements of their program. Math 106 is not equivalent to a 200-level statistics course with a calculus prerequisite, and students cannot expect to obtain credit for both Math 106 and such a 200-level calculus-based statistics course.

Students who have credit for or are enrolled in a calculus course are expected to take Math 106 or Math 270.

Note: UCFV math degrees require MATH 270, not MATH 106.

**RATIONALE:**

**COURSE PREREQUISITES:**      Math 12, UCFV MATH 095 with C or better, Applications of Math 12 with C or better, or MATH 109, or MATH 110

**COURSE COREQUISITES:**

<b>HOURS PER TERM FOR EACH STUDENT</b>	<b>Lecture</b>	<b>75</b>	<b>hrs</b>	<b>Student Directed Learning</b>	
	<b>Laboratory</b>		<b>hrs</b>	<b>Other - specify:</b>	<b>hrs</b>
	<b>Seminar</b>		<b>hrs</b>		
	<b>Field Experience</b>		<b>hrs</b>		<b>hrs</b>
				<b>TOTAL</b>	<b>75</b>

**MAXIMUM ENROLMENT:** 35

Is transfer credit requested?      **:**    Yes      **9** No

**AUTHORIZATION SIGNATURES:**

**Course Designer(s):** Susan Milner and Linda Riva      **Chairperson:** J. D. Tunstall  
**Curriculum Committee**

**Department Head:** S. Milner      **Dean:** \_\_\_\_\_

**PAC: Approval in Principle** \_\_\_\_\_      **PAC: Final Approval:** December 16, 1998  
**(Date)**      **(Date)**

**MATH 106**  
**NAME & NUMBER OF COURSE**

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**SYNONYMOUS COURSES:**

(a) replaces \_\_\_\_\_  
(course #)

(b) cannot take \_\_\_\_\_ for further credit  
(course #)

**SUPPLIES/MATERIALS:**

**TEXTBOOKS, REFERENCES, MATERIALS** (List reading resources elsewhere)

TEXTS: W.C. Scheffler, Statistics: Concepts and Applications, Benjamin/Cummings, 1988.

**OBJECTIVES:**

The successful student will:

1. develop critical thinking in the application of statistical ideas and learn to recognize and avoid common misuses of statistics;
2. learn through practice the logic, methods, and meaning of statistics;
3. develop an understanding of the statistical techniques being widely applied in psychological, social, educational, biological, and other research.

Since this will probably be the only statistics course that many students will take, the underlying goal is to develop in the student an ability to intelligently evaluate published statistical data.

**STUDENT EVALUATION PROCEDURE:**

Assignments .....	15%
Mid-terms .....	40%
Quizzes .....	5%
Final Exam .....	40%

**COURSE CONTENT**

The order of the topics, with appropriate **chapter** in the text, is as follows:

<weeks 1 through 4>

- A. INTRODUCTION - descriptive and inferential statistics **1**
- B. DESCRIPTIVE STATISTICS
  - 1. types of data **2.1**
  - 2. measures of central tendency **2.2**
  - 3. measures of dispersion, Chebyshev **2.3, 2.4**
  - 4. quantiles **2.5**
  - 5. frequency tables **2.6**
  - 6. stem-and-leaf, box-and-whisker diagrams **2.7**
  - 7. graphs: bar, pie, line, histograms, ogives, pictograms **3**
  - 8. linear correlation, Pearson's  $r$  **12.1-12.3**
  - 9. simple linear regression, coefficient of determination **11.1-11.4**

<weeks 4 through 8>

- C. PROBABILITY AND SAMPLING
  - 1. probability models **4.1, 4.2**
  - 2. calculating probabilities: "and", "or" **4.3-4.6**  
(includes the use of Venn and tree diagrams)
  - 3. permutations and combinations **4.7**
  - 4. probability distributions **5.1**
  - 5. the binomial and normal distributions **5.2-5.4**
  - 6. populations versus samples, random sampling, estimators **6.1-6.3**
  - 7. the sampling distribution of the mean **6.4, 6.5**

<weeks 8 through 14>

- D. INFERENCE STATISTICS
  - 1. hypothesis testing in general
  - 2. testing the mean, large samples; confidence intervals for the mean **7.2-7.6, 6.6**
  - 3. testing the proportion, CI for the proportion **7.7, 6.7**
  - 4. the difference between means, large samples **7.8, 7.9**
  - 5. the difference between proportions **7.10**
  - 6. testing the mean, CI for the mean, small samples **8.1-8.4**
  - 7. the difference between means, small samples, independent and dependent populations **8.5-8.8**
  - 8. inferences about the correlation coefficient, the slope of the regression line **12.4, 11.5**
  - 9. confidence belts **11.6, 11.7**
  - 10. Chi-square tests: goodness-of-fit and independence **10.1-10.3**
  - 11. one-way ANOVA **9.1-9.3**