

Statistics for Law Enforcement

Course outline prepared by Nicole Stalnaker, MA

*Course length is: 40 hours (M-F 8am – 5pm) which is equivalent to
three-semester credit hours*

Course Objective:

1. Understand and describe general approaches to and problems with public sector research & data measurement
2. Understand basic statistical analysis of raw data
3. Evaluate statistical research performed by others

Textbook:

1. *Statistics for Public Administration: Practical Uses for Better Decision Making*, 2nd edition, Maureen Berner, International City/County Management Association: Washington D.C., ISBN: 978-0873267717

Modules:

1. Monday: Chs. 1-3
2. Tuesday: Chs. 4 & 5
3. Wednesday: Chs. 6 & 7
4. Thursday: Chs. 8 & 9
5. Friday: Course review, final exam review, & final exam

Learning Outcomes:

1. Module 1:
 - Explain stats as a language & how it is used by policy makers
 - Understand the 8 stages of the research design process

- Develop a testable hypothesis
 - Differentiate between 3 types of research designs
 - Classify 3 different types of statistical data
 - Explain differences between 3 types of data sets
 - Understand both descriptive & inferential statistics
 - Create a frequency distribution table & histogram and explain data contained in both.
 - Have a good working vocabulary of terms related to all outcomes above.
2. Module 2:
- Understand measures of dispersion, including standard deviation.
 - Calculate the mean, median, and mode of descriptive data.
 - Calculate the standard deviation of a data set.
 - Explain what a Z-score represents, when to use it, and how to calculate it.
 - Define the Central Limit Theorem.
 - Define probability, the basic law of probability, statistical independence & dependence and application with inferential statistics.
 - Have a good working vocabulary of terms related to all outcomes above
3. Module 3:
- Understand the concepts of sampling, sample error, likelihood ratios, confidence intervals & confidence levels.
 - Determine confidence intervals & margin of error.
 - Calculate a T-score and describe how it differs from a Z-score.
 - Understand statistical significance and the different confidence levels using p value.
 - Describe the difference between Type I & Type II errors & give examples.
 - Explain the difference between hypothesis and null hypothesis & give examples.
 - Differentiate between material significance and statistical significance and how & why you would use them.
 - Have a good working vocabulary of terms related to all outcomes above.
4. Module 4:
- Explain the concept of obtaining a 'good sample' and why this is important.
 - Calculate a sample size incorporating a desired confidence level, standard

deviation, and confidence level.

- Compare & contrast different types of sampling methods and explain the advantages & disadvantages including possible errors.
- Describe factors involved in 'good' response rates.
- Explain the difference between co-movement & causality.
- Draw conclusions using both nominal & ordinal data.
- Define Pearson's correlation coefficient, r .
- Understand how to use the Bayesian Principle, utilizing new & existing information.
- Explain both positive and negative associations between variables.
- Interpret bivariate & multivariate regression to explain the relationship between variables.
- Have a good working vocabulary of terms related to all outcomes above.

Assessments:

1. 8 mini quizzes (2 each day, modules 1-4) - 40%
2. In-class assignments - 10%
3. Comprehensive final exam (modules 1-4) - 50%