Oakland University School of Business Administration
Department of Decision and Information Sciences
QMM 240: Statistical Methods for Business I (3 credit hours)
Winter 2015

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Web: http://www.sba.oakland.edu/faculty/murphy
Office Hours: 12:30-1:00 pm on Mondays and Wednesdays; 4:00-6:00 pm on Wednesdays; and by appointment.

Course Description: Covers descriptive statistics, probability, probability distributions, sampling distributions, estimation, and hypothesis tests. Emphasizes business applications and computer analysis of data. Satisfies the university general education requirement in the knowledge applications integration area.

Course Prerequisites: MTH 121 or MTH 122 or (MTH 141 or MTH 154), and MIS 100 (or CSE 125 or CSE 130 or MIS 200) with a minimum grade of 2.0 in each course, and sophomore standing.

General Education Learning Outcomes—Knowledge Applications Area:
The student will demonstrate:

- how knowledge in a field outside of the student’s major can be evaluated and applied to solve problems across a range of applications
- knowledge of the personal, professional, ethical and societal implications of these applications.

Cross-Cutting Capacity: Critical Thinking.

Course Goals and Objectives:

QMM 240 seeks to help the student:

- Understand the roles and limitations of statistics in addressing decision problems faced by individuals, firms, organizations, and public agencies, and the contexts in which such problems arise.
- Organize, summarize, compare, and analyze univariate data.
- Recognize and apply common probability distributions to situations that may arise in business contexts (e.g., binomial, Poisson, normal).
- Create and interpret confidence intervals for the mean and proportion, and estimate required sample sizes for desired levels of precision.
- Perform hypothesis tests for the mean and proportion, and recognize situations in which they would be appropriate.
- Understand Type I error, power, and the role of p-values in hypothesis tests.
- Use computers confidently and effectively in the previous tasks.
**Computer Projects:** There will be two computer projects assigned during the term. The two assignments will account for 25% of your course grade.

**Examinations:** There will be three exams during the term. They will take place on the following dates:

- Exam I  Wednesday, February 4
- Exam II  Wednesday, March 18
- Exam III Wednesday, April 22 (7-9 pm)

Each exam will cover approximately 1/3 of the course. The last exam is not comprehensive.

**Make-Up Exams:** Make-up exams will only be given at my discretion. Work related reasons for missing exams are generally not acceptable. If you do miss an exam, then you will need to provide third-party documentation of the reason for your absence. Should I decide to let you take a make-up exam, you will be allowed to do so at a mutually convenient time during finals week.

**Academic Conduct Policy:** Students are advised to familiarize themselves with the Oakland University Academic Conduct Policy articulated here: [http://catalog.oakland.edu/content.php?catoid=17&navoid=1145#Other_Academic_Policies](http://catalog.oakland.edu/content.php?catoid=17&navoid=1145#Other_Academic_Policies) in the Oakland University Undergraduate Catalog. I have a zero tolerance policy for cheating. Cheating is easily detectable. If you give the appearance of cheating, then I immediately refer your case to the Office of the Dean of Students. In addition, if your exam answers are copied by another student, then I will assume that you are complicit in the academic misconduct and such cases will also be submitted to the Dean of Students. (To prevent your answers from being copied by another student, simply protect your work.) Penalties for cheating at Oakland are excessive and usually result in a 0.0 for the course and suspension or expulsion.

**Class Assessment and Assignment Weights:**

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<thead>
<tr>
<th>Assessment</th>
<th>Dates</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Exam I</td>
<td>February 4</td>
<td>25%</td>
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<tr>
<td>Exam II</td>
<td>March 18</td>
<td>25%</td>
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<tr>
<td>Exam III</td>
<td>April 22</td>
<td>25%</td>
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<tr>
<td>Computer Projects</td>
<td>As assigned</td>
<td>25%</td>
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**Homework and Study Materials:** I will post suggested homework problems and various types of study materials to the QMM 240 section of my personal webpage (here-- [http://www.sba.oakland.edu/faculty/murphy](http://www.sba.oakland.edu/faculty/murphy)). You should click on this page and
bookmark it as soon as possible. You should be sure to do the suggested homework
problems on a timely basis and check your answers against the correct answers supplied in
the back of the textbook to ensure that you understand the material as we proceed. I will
also post the daily reading assignment and other relevant course announcements to the
webpage. You should check the webpage frequently.

COURSE OUTLINE

I. Descriptive Statistics: Types of data, graphical techniques for quantitative data,
frequency histograms, measures of central location, measures of dispersion, data
exploration.

Read pp. 23-30, 63-75, 80-85, and 111-145.

II. Probability: Probability theory, rules of probability, probability trees, Bayes' law.


III. Random Variables and Discrete Probability Distributions: Random variables,
xpected value, variance, discrete distributions, the Binomial distribution.


IV. Continuous Probability Distributions: Basic properties, the uniform distribution,
the normal distribution, the standard normal distribution, normal probabilities.

Read pp. 255-274.

V. Sampling Distributions: Central Limit Theorem, sampling distribution of $\bar{x}$,
sampling distribution of $\hat{p}$, properties of estimators.

Read pp. 295-305.

VI. Estimation: Point versus interval estimators, estimating the population mean,
Student's $t$ distribution, estimating the population proportion, the $\chi^2$ distribution,
estimating the variance, selecting the sample size.

Read pp. 306-323 and 326-333.

VII. Hypothesis Testing: Basic ideas, Type I and Type II errors, power, testing the
mean, one-tail and two-tail tests, p-values, t-tests, inference about a population
proportion, inference about a population variance.

Read Ch. 9.