

## **QMM 2400: Statistical Methods for Business I Winter 2018**

Date and Time	M-W 10:00-11:15 am
Classroom	PH 316
Professor	Yazan Roumani
Office	342 Elliot Hall
Office hours	M-W 11:30-12:30 or by appointment
Phone	(248) 370-4974
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### **Course Description:**

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. Prerequisite for knowledge applications: completion of the general education requirement in the formal reasoning knowledge foundation area.

Prerequisite: MTH 1221 or MTH 1222 or MTH 1441 or MTH 1554, and MIS 1000 or CSE 130 or CIT 130 or CSI 1300 with a minimum grade of 2.0 in each course, and sophomore standing.

### **Learning Objectives:**

The objective of this course is to understand the role of statistics in the decision-making process of a business environment. At the end of the course, students should understand the following topics:

- The different types of data and sampling methods
- Tabular and graphical methods for describing data sets
- Numerical methods for describing data sets
- Probability
- Probability distributions and discrete random variables
- Continuous random variables
- Sampling distributions of the sample mean and sample proportion
- Point and interval estimation of population means and proportions
- Hypothesis tests for population means and proportions

**Textbook:** Applied Statistics in Business and Economics 5<sup>th</sup> Edition, Doane and Seward

**Performance Evaluation:**

Participation and in-class exercises	5%
Homework Assignments	20%
Quizzes	20%
Exam 1	15%
Exam 2	15%
Final Exam (comprehensive)	25%

- **No make-up homework assignments, quizzes or exams will be given**
- **No incomplete grades will be given**

**Grading:**

Course Total	Semester Grade	Course Total	Semester Grade	Course Total	Semester Grade	Course Total	Semester Grade
99-100	4.0	83-84	3.2	74	2.4	66	1.6
97-98	3.9	81-82	3.1	73	2.3	65	1.5
95-96	3.8	80	3.0	72	2.2	64	1.4
93-94	3.7	79	2.9	71	2.1	63	1.3
91-92	3.6	78	2.8	70	2.0	62	1.2
89-90	3.5	77	2.7	69	1.9	61	1.1
87-88	3.4	76	2.6	68	1.8	60	1.0
85-86	3.3	75	2.5	67	1.7	0-59	0.0

**Homework:**

Homework assignments must be done independently. Homework assignments are due at the beginning of class on the due date. If you are unable to attend class, you must email me your homework before the beginning of class of the due date. Late assignments will not be accepted. Late or missed assignments will result in a grade of 0 for the assignment. In general, there will be no make-up homework assignments. In the event that extraordinary circumstances prevent you from doing the homework assignment, you must contact the instructor prior to the due date and present the proper documentation. No copying problem solutions from solution manuals. Cheating will result in a grade of 0 for the applicable homework assignment; further disciplinary actions might also be taken.

**Quizzes:**

All quizzes will be conducted online at: <https://moodle.oakland.edu/login/index.php>. Quizzes are open book and open notes but must be done independently. Quizzes should be completed within the specified time frame. Missed quizzes will result in a grade of 0 for the quiz. In general, there will be no make-up quizzes. In the event that extraordinary circumstances prevent you from taking the quiz, you must contact the instructor prior to the quiz deadline and present the proper documentation. Cheating will result in a grade of 0 for the applicable quiz; further disciplinary actions might also be taken.

**Exams:**

All exams will be conducted in class (closed book, closed notes). You will be allowed to bring a calculator and one 8.5" x 11" sheet to the exam (no attachments or layers allowed). No cell phones or any other electronic devices allowed. You will not be permitted to start the exam after anyone has left the room. In general, there will be no make-up exams. In the event that extraordinary circumstances prevent you from taking the exam at the scheduled time, you must contact the instructor *prior* to the examination and present the proper documentation. Cheating will result in a grade of 0 for the applicable exam; further disciplinary actions might also be taken.

**Important deadlines:**

**Add/drop deadline: January 17<sup>th</sup>**

**Withdrawal deadline: March 14<sup>th</sup>**

**Classroom Conduct:**

You are expected to arrive on time and be prepared for every class. Make sure you print PowerPoint slides and tables posted on Moodle before coming to class. If you need to leave early, you should let the instructor know before class. No talking with other students during class. It is distracting to students around you and to the instructor. You will be asked to leave the classroom if you engage in conversation with other students. The use of laptops or tablets is not allowed. Make sure your phone is turned off. No texting, napping or Internet browsing during class. Engaging in any of the above mentioned activities will negatively affect your participation grade.

**Attendance:**

Attendance is critical to success in the course. If you are unable to attend class, you are responsible for completing the material covered on the syllabus.

**Academic Integrity:**

Cheating on examinations, plagiarism, falsifying reports/records, and unauthorized collaboration, access, or modifying of computer programs are considered serious breaches of academic conduct. Please review Oakland University's Academic Conduct policy. Any indication of academic misconduct (cheating, plagiarism, etc.) will be reported to the Office of the Dean of Students to evaluate.

**Statement Regarding Students with Disabilities:**

The Office of Disability Support Services (DSS) is the campus office responsible for verifying that students have disability related needs for academic accommodation and for planning appropriate accommodations. Students with learning, psychological or physical disabilities who need academic accommodations can contact DSS in room 103A North Foundation Hall (Phone: 248-370-3266; TYY: 248-370-3268)

## Tentative Schedule

Week	Date	Topic
1	1/3	Chapter 1 (Overview of Statistics) & Chapter 2 (Data Collection)
2	Week of 1/8	Chapter 2 (Data Collection) & Chapter 3 (Describing Data Visually)
3	<b>1/15</b>	<b>No class – Martin Luther King, Jr. Day</b>
	1/17	Chapter 3 (Describing Data Visually) & Chapter 4 (Descriptive Statistics)
4	Week of 1/22	Chapter 4 (Descriptive Statistics)
5	1/29	Exam 1 review
	<b>1/31</b>	<b>Exam 1</b>
6	Week of 2/5	Chapter 5 (Probability)
7	Week of 2/12	Chapter 5 (Probability)
8	<b>Week of 2/19</b>	<b>No class – Winter Recess</b>
9	Week of 2/26	Chapter 6 (Discrete Probability Distributions)
10	Week of 3/5	Chapter 7 (Continuous Probability Distributions)
11	Week of 3/12	Chapter 7 (Continuous Probability Distributions) & Exam 2 Review
12	<b>3/19</b>	<b>Exam 2</b>
	3/21	Chapter 8 (Sampling Distributions and Estimation)
13	Week of 3/26	Chapter 8 (Sampling Distributions and Estimation)
14	Week of 4/2	Chapter 9 (One-Sample Hypothesis Tests)
15	Week of 4/9	Chapter 9 (One-Sample Hypothesis Tests)
16	4/16	Final Exam Review
		<b>Final Exam Monday (4/23) 12:00-3:00 PM</b>

## QMM 2400 Syllabus Supplement - University General Education Requirement

This course covers descriptive statistics, probability, probability distributions, sampling distributions, estimation, and hypothesis tests. Emphasizes business applications and computer analysis of data. Its prerequisites are MTH 121 or MTH 141, and MIS 100 (or MIS 200 or CSE 125 or CSE 130) with a minimum grade of 2.0 in each course. MTH 121 is a knowledge foundation area in the General Education Program. QMM 2400 satisfies the General Education requirements in the *knowledge applications* area by demonstrating how knowledge in a field outside of the student's major can be evaluated and applied to problems across a range of applications, and knowledge of the personal, professional, ethical and societal implications of these applications.

QMM 2400 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.

By applying the methods taught in the MTH 121 prerequisite course, QMM 2400 builds on MTH 121 by using concepts such as linear equations, independent and dependent variables, algebraic functions, and graphs to evaluate and apply knowledge in a field outside of the student's major area of study. It also builds on prerequisite courses in information technology (MIS 100 or MIS 200 or CSE 125 or CSE 130) for basic concepts and terminology of computing and desktop application software (Excel, Word) to perform calculations and write reports on homework assignments involving business-oriented applications of statistics. By applying the principles taught in prerequisite courses, QMM 2400 evaluates and applies knowledge in a field outside of the student's major area of study to address problems facing business managers and other administrators. QMM 2400 applies knowledge in a field outside of the student's major area of study to calculate descriptive statistics, calculate probabilities from given probability functions, construct confidence intervals using appropriate formulas, calculate test statistics in hypothesis tests, and create graphs of functions. Applications include using the rules of algebra to calculate sums, test statistics, probabilities, combinations, permutations, and sample sizes. Concepts of functions (rules, tables, equations) are used to define random variables and interpret their domains and ranges. The concept of graphs of functions is applied to probability distributions. The concept of an exponential function is applied to the normal and Poisson probability density functions.

The cross-cutting capacity is *critical thinking*. Students learn to organize data and use it to improve decision-making in business or in not-for-profit organizations (e.g., government, health care). Because this course applies knowledge from prerequisite courses along with methods taught in this course to problems of managerial decision making, its content enhances students' critical thinking skills. Students also learn to avoid common pitfalls in reasoning from data (e.g., generalization from non-random samples, misinterpretation of confidence intervals, incorrect interpretation of  $p$ -values in hypothesis tests). Writing is not a major component of this course. However, instructors may assign written homework exercises and/or computer projects to individuals or teams. Because of the class size, such written assignments are limited in scope and frequency.

*Revised February 8, 2007*