MTH 232 Statistics

Olivet College
Fall 2018

M, T, R 9:20 – 10:10
M, R Mott 103
T Mott 112

Instructor: Janine Peters
Office: Mott 306 C
Phone: 269-749-7659
Email: jpeters@olivetcollege.edu

Office Hours: M, T, R 1:00 – 1:40
W 10:30 – 12:00
F 9:00 – 10:30
and by appointment

Course Description: *4 semester hours credit.*
Prerequisites: MTH 130, placement into MTH 150 or instructor permission.
Statistics and probability, including measures of central tendency and dispersion, normal and binomial distributions, hypothesis testing, confidence intervals, correlation, regression and nonparametric tests. Statistical software introduction. *Satisfies the College mathematics proficiency requirement provided a grade of C or better is earned.*

Instructional Resources

- Text: Elementary Statistics, 7th ed., Larson, Prentice Hall.
- A scientific calculator is required; a TI graphing calculator is recommended.
- Khan Academy videos may be accessed at https://www.khanacademy.org/math/probability

Activities

- Within class we will engage in lectures, class discussions, small group and independent assignments.
- Outside of class you should plan to spend eight hours per week completing reading, homework assignments, and studying.

Course Learning Outcomes:	**Learning Assessments**
Describe data verbally, graphically and symbolically.	Homework, Case Study I, Exam I, Final Examination
Apply fundamental principles of probability to describe data. Compute conditional probabilities in the context of two-way tables.	Homework, Exam II, Final Examination
Use the normal distribution to interpret standard scores and compute probabilities.	Homework, Exam II, Final Examination
Use the Central Limit Theorem to determine the distribution of the sample mean and sample proportion.	Homework, Exam II, Final Examination
Estimate a population mean or proportion using a point estimate and confidence interval, interpret confidence level and margin of error, and understand the relationship between margin of error, confidence level and sample size.	Homework, Case Study II, Exam III, Final Examination
Formulate and carry out hypothesis tests for means and proportions; interpret statistical significance.	Homework, Case Study III, Exam III, Final Examination
Use Chi-Square tests to determine goodness-of-fit and independence.	Homework, Final Examination
Summarize relationships in bivariate data graphically, calculate and interpret correlation coefficients and least squares linear regression	Homework, Case Study IV, Final Examination
Use statistical software to analyze a set of data.	Case Studies
Discern between appropriate and inappropriate uses of statistical methods.	Homework, Examinations

Program Learning Outcomes

This course supports the following Mathematics and Actuarial Science major outcomes:

1. *Communication. Students will communicate quantitative information effectively, using correct mathematical terminology and notation. (MTH/AS)*
2. *Data Analysis. Students will demonstrate the ability to graphically and numerically summarize data, interpret, and draw inferences from these summaries. (AS)*
3. *Problem Solving. Students will model and analyze applied problems using appropriate mathematical methods, and evaluate their efficacy. (MTH/AS)*

College-Wide Learning Outcomes

This course supports the following College-Wide Learning Outcomes:

2.2 Quantitative Analysis*: Analyze numerical information and integrate quantitative methods into problem solving.*

Evaluation Procedures and Grading System

Description	**Points**
Three in class examinations @ 100	300
Comprehensive final exam	100
Homework	100
In-class activities	60
Case studies	40
Total	**600**

Grading Scale

93-100% A	87-89% B+	77-79% C+	67-69% D+	0-59% F
90-92% A-	83-86% B	73-78% C	63-66% D	
	80-82% B-	70-72% C-	60-62% D-	

Homework Assessment Rubric

10 points	8 points	6 points	4 points
• All assigned problems are completed. • Detailed work is shown for all problems. • Work is accurate. • Work is neat and organized.	• Nearly all problems are completed • Work is shown for all problems. • Nearly all work is accurate. • Work is generally neat and organized.	• A significant number of problems are missing. • Work is not detailed. • A significant number of inaccuracies. • Work is not neat and organized.	• More than half of the assignment is missing • There are answers but no work. • Work is sloppy and/or disorganized.

Strategies for Success

- Attend <u>every</u> class; be punctual.
- Have assigned problems worked by the next class period; be ready to discuss the assignment.
- Read the textbook carefully, working examples given within the reading. Ask questions in class about anything you don't understand.
- Allocate at least eight hours per week outside of class for reading, preparation and homework.
- Have all materials with you each day (notebook, pencil, textbook, and calculator).
- Take good lecture notes; be engaged and work problems with the class.

Course Outline

Week of	Topic	Reading Assignment
8/20	Ch. 1 Introduction to Statistics, Data Classification, Collection, and Experimental Design	§1.1, 1.2, 1.3
8/27	Ch. 2 Descriptive Statistics: Frequency Distributions, Graphs and Displays, Measures of Central Tendency	§2.1, 2.2, 2.3
9/3	**Labor Day Holiday 9/3;** Ch. 2 Measures of Variation and Position	§2.4, 2.5
9/10	Technology Lab; **Exam I**	
9/17	Ch. 3 Probability	§3.1, 3.2, 3.3
9/24	Ch. 4 Discrete Probability Distributions	§3.4, 4.1, 4.2
10/1	Ch. 5 Normal Probability Distributions	§5.1, 5.2, 5.3
10/8	Ch. 5 Central Limit Theorem; **Exam II**	§5.4
10/15	Ch. 6 Confidence Intervals	§6.1, 6.2, 6.3, 6.4
10/22	Ch. 7 One Sample Hypothesis Tests	§7.1, 7.2, 7.3, 7.4
10/29	Ch. 8 Two Sample Hypothesis Tests	§8.1, 8.2, 8.3
11/5	Ch. 8 Two Sample Hypothesis Tests; **Exam III**	§8.4
11/12	Ch. 9 Correlation and Regression	§9.1, 9.2, 9.3, 9.4
11/19	Ch. 10 Goodness of Fit, Independence; **Thanksgiving Holiday 11/21 – 11/23**	§10.1, 10.2
11/26	Ch. 10 Comparing Variances, ANOVA; Review Activity	§10.3, 10.4
	Final Examination Monday, December 3, 2018 1:15 – 3:15 p.m.	

Course Policies

As members of the Olivet College community, we agree to follow the principles of responsibility presented in the Olivet College Compact. The following portions of the compact have particular bearing on this course.

" I am responsible for my own learning and personal development"

Each individual is responsible for completing and being prepared to discuss all assignments in a timely manner. We commit to being in class, on time, or absent only in the case of an emergency, serious illness, unsafe driving conditions (off-campus residents only), or participation in a college-sanctioned event (with prior notification). Written documentation may be required to confirm any such absence.

In the event that an absence is unavoidable, the student should contact the instructor in advance in the case of a planned absence, or as soon as possible in the case of an emergency. Lecture notes should be obtained from a fellow student, as well as the assignment posted on Blackboard https://blackboard.olivetcollege.edu/

- No make-ups will be given for in-class activities (no exceptions). One such grade will be dropped at the end of the semester to accommodate extenuating circumstances.

- In the case of a planned absence, arrangements should be made in advance to submit assignments/take exams prior to the scheduled due date.
- In extenuating circumstances, with documentation and instructor approval, an extension may be granted on assignment/exam deadlines with an automatic point reduction corresponding to 10% of the number of points possible per day. If arrangements are not made in advance, a grade of zero will automatically be recorded for the assignment/exam.

"I am responsible for contributing to the learning of others"
We strive to conduct ourselves in a manner which will not detract from the learning of others.

- Electronic devices other than calculators must be turned off before entering the classroom. Texting in class will result in the loss of participation points. Laptops may be used only for coursework.
- Avoid being late to class, leaving class early, and holding conversations aside from class discussion. Participate in group assignments in a positive manner, contributing as appropriate.

"I am responsible for treating all people with respect"
We will make a sincere effort to be aware of the diverse backgrounds and learning styles of all class members. Each person's questions and remarks contribute to the learning of others, and hence are valued. We agree that our interactions with others, both in and out of the classroom, will be respectful and polite. We will try to honor all commitments to the best of our ability.

"I am responsible for behaving and communicating with honesty and integrity"
We will always be honest in words (verbal and written) and actions. Cheating of any kind will not be tolerated, and may result in a zero for the assignment or failure in the course. Cheating includes, but is not limited to, plagiarism (submitting another's work as one's own) and using non-sanctioned materials on quizzes and tests. The Olivet College Academic Integrity Policy may be accessed at
https://my.olivetcollege.edu/ICS/icsfs/Academic_Integrity_Policy.pdf?target=9df8ff19-7db2-436b-8715-5122c6252948

You are encouraged to collaborate with other students to discuss class topics, homework and case studies, or work with a tutor if you need extra assistance. Each student is required to write his or her own solutions. This means you should not look at another's work as you write your solution, and nor should you allow another to look at your work as they write their solution. You should not share electronic documents with other students.

Special Needs and Disability Policy
Students requiring accommodation on exams or assignments due to disabilities must speak with the professor at the start of the term (and at least two weeks before the assignment due date or exam in question) to make appropriate arrangements. Such arrangements require documentation from the Success Center. Students with disabilities who believe that they may need accommodations in this course should contact the Student Resource Center to initiate the necessary paperwork. All deadlines apply to students needing accommodations.

Tutors are available to all students. You may make arrangements through the Success Center.

Changes to this syllabus may be made at the discretion of the instructor.