Department of Mathematics and Science

MTH 152 D03 Elementary Statistics

Fall 2018

Course Information

3 credit hours

MW 10:45 am – 12:15 pm
Brunkhorst Hall BH 207

Instructor Information

Mary Lou Townsend, Assistant Professor

Contact Information

Office: HH 103-J
Phone Number: (410) 334-2868
Email: mtownsend@worwic.edu

Office Hours

Monday 2:30 pm – 3:30 pm
Wednesday 2:30 pm – 3:30 pm
Thursday 12:30 pm – 3:30 pm
Additional hours by appointment

Course Description

This course introduces elementary statistics through a critical examination of its subjects and applications. Topics from descriptive statistics include data organization, expectation, and measures of variation. Also covered are random variables, probability laws, counting techniques, binomial and normal distributions, applications to the central limit theorem, confidence intervals and tests of statistical hypotheses involving the mean, median, and proportions. Topics from parametric and nonparametric statistics are introduced.

Hours: 39 lecture. Prerequisites: ENG 095 or ENG 097 and MTH 092 with grades of “C” or better or acceptable reading and mathematics diagnostic assessment scores. Usually offered in the fall, spring and summer.

Course Materials

ACROBATICQ, an online course platform, Access Code available for purchase in the campus Bookstore or online through link on Blackboard


CALCULATOR TI 83/84+

Supplemental Resources

written assignments require APA guidelines

Blackboard

Blackboard is being used as supplementary site in this course. To access course content in Blackboard you need to have access to a computer with an Internet connection (other requirements may apply). On campus Resource Labs are available and hours of operation can be found on the college website.

Blackboard Login

1. From the Wor-Wic home page, click on myWor-Wic (top-right above Quick Links).
2. Enter your Wor-Wic user ID and password (same as your Wor-Wic email user ID and password) to access the portal.
3. In the “Blackboard Login” web part, select the link to enter into the Blackboard site.
4. Blackboard may also be accessed through Quick Links on the college website and through the Blackboard link at the bottom of each page on college website.
Objective 1: Organize and summarize quantitative and qualitative data. (General Education Objectives 1,3,4,5,6)

Assessment Goals:
A. Understand statistics terminology.
B. Distinguish between population and sample.
C. Calculate measures of central tendency and measures of variation.
D. Construct standard graphical displays.
E. Describe the relationship between 2 variables

Assessment Strategies:
1. In class activities
2. Homework
3. Test questions
4. Exam questions

Objective 2: Calculate and interpret (General Education Objectives 1,3,4,5,6)

Assessment Goals:
A. Use the laws of probability to determine probability, or use the laws of probability to calculate the probabilities of compound events.
B. Distinguish between discrete and continuous probability distributions.
C. Use the binomial probability distribution function to calculate probability.
D. Use the normal probability distribution function to calculate probability

Assessment Strategies:
1. In class activities
2. Homework
3. Test questions
4. Exam questions

Objective 3: Apply inferential statistical models to draw conclusions about populations. (General Education Objectives 1,3,4,5,6,7,8)

Assessment Goals:
A. Use the Central Limit Theorem
B. Calculate confidence intervals
C. Test one and two sample hypotheses

Assessment Strategies:
1. In class activities
2. Homework
3. Test questions
4. Exam questions

Objective 4: Employ technology. (General Education Objectives 4,5)

Assessment Goals:
A. Use the graphing calculator to perform statistical operations
B. Use statistical application software to perform statistical operations and create graphical representations

Assessment Strategies:
1. In class activities
2. Homework
3. Test questions
4. Exam questions
Evaluation

This course will include homework assignments via Acrobatiq, in-class and out-of-class assignments, quizzes, tests, and a comprehensive, department final exam. Your final grade will be calculated as follows:

<table>
<thead>
<tr>
<th>Grading:</th>
<th>Grading Scale:</th>
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<tbody>
<tr>
<td>Homework and Writing Assignment(s)</td>
<td>A ............................................... 90 to 100</td>
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<td>B ......................................... 80 to 89</td>
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<td>Quizzes</td>
<td>C ......................................... 70 to 79</td>
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<tr>
<td>Tests</td>
<td>D ......................................... 60 to 69</td>
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<tr>
<td>Exam</td>
<td>F ....................................... Below 60</td>
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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Homework and Writing Assignment(s)</td>
<td>15%</td>
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<tr>
<td>Quizzes</td>
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<td>Tests</td>
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<tr>
<td>Exam</td>
<td>25%</td>
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Math Lab Hours and Location

The Wor-Wic Math Lab (Brunkhorst Hall 225) is an excellent resource for you as you work outside the class time to complete the assigned work. You can access the computers in the math lab as well as receive assistance from a lab instructor. Group tutoring is available in the math lab with the scheduled times posted in the lab.

Phone Number: (410) 334-2818

<table>
<thead>
<tr>
<th>Math Lab Hours:</th>
<th>Open:</th>
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<tbody>
<tr>
<td>Monday through Thursday ...............</td>
<td>September 5th through December 13th</td>
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<td>Friday ..................................</td>
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<tr>
<td>Saturday ................................</td>
<td>December 10th through 13th</td>
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<td>Sunday ..................................</td>
<td>8:30 am to 6:30 pm</td>
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<td>Closed:</td>
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<td>November 21st through November 25th</td>
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Course Content

Pedagogy:

This will probably be quite different from any math course you have taken before. In part, this is because we will incorporate activities using real data into our class time. You will be expected to work through informative modules in an online platform called Acrobatiq. It will be assumed that you have worked through the assigned modules, learning essential definitions and principles before class. During class time you will learn to put these new ideas and techniques to work to answer challenging and realistic questions, through participation in activities, discussions, and technology-based investigations, with the close guidance of the instructor. You will learn how to think like a statistician, choose the right statistical tool for the right job and carry out statistical investigations to solve real problems and make informed decisions.

But it will also be different because statistics is not the same as mathematics! In statistics, one learns to combine statistical concepts, critical thinking, and numerical calculations to determine what is probably true, according to our best judgement, based on the data evidence we have. This is in sharp contrast to most mathematics, in which one establishes results with absolute certainty. In statistics, we attempt to make sense of real data to determine and argue for a “likely truth.” You will learn to think and work in this important way if you engage in the course with energy and determination and ask for help when you need it.

Writing Assignment: Students will read an excerpt from the book “How to Bake π” by Eugenia Chang and defend the statement “Mathematics is science not mathematics.” Details provided in class.
Electronic Assignment: Students will be required to access the Wor-Wic database, find an appropriate article on a topic of their choosing, identify variables and study design and cite the article using APA format. Details provided in class.

Cultural Diversity Assignment: Students will collect data and compare a racial, ethnic or cultural group to the Wor-Wic student population as a whole. Details provided in class.

Course Policies

Attendance Policy
Attendance is taken at every class meeting and is important to success in this course. Because of the cumulative nature of a mathematics class, missing one or more classes can adversely affect performance in the course. If a student misses class, arrives late or leaves early, the student is responsible for material missed.

If a student misses class on the day of a test, it is the student’s responsibility to contact the instructor prior to the next scheduled class meeting. If contacted promptly and a legitimate, documented reason is provided and acceptable, the instructor will schedule the student for a make-up test that may be of a different format and with a specific date for completion.

Grading Policy
Learning modules in Acrobatiq will be assigned weekly. You must complete them before class as assigned in order to keep up with the in-class activities to succeed in this course. Most of the reading and activities within Acrobatiq will serve as a guided learning plan for you to learn the required content, which with the instructor’s help you will put into action and context during class time. Within Acrobatiq you will earn credit for completing adaptive Apply What You Know and Checkpoint homework assignments. Late work will be accepted for half credit. There will be a quiz given every class period that a test is not given. Students absent when a quiz is given will not have an opportunity to make up the grade. One quiz and two homework assignments will be dropped at the end of the semester.

You will be asked to engage in group and/or individual activities throughout the semester, some of which may result in written work to be submitted. Students absent during the activity will not have an opportunity to make up the grade.

Additionally, there will be three in-class tests and one two-hour cumulative final exam. Attendance during all tests and exams is mandatory. Make-up tests, in general, will not be given. However, in the case of a documented emergency, notify the instructor prior to the end of the test period for consideration of a make-up. This should only be necessary in extreme circumstances.

Topics in Elementary Statistics, like most math classes, build on previously introduced topics. Scoring below 70% on any unit test indicates that there are gaps in your understanding, which will most likely have a compound effect on your success in subsequent units. Therefore, if you score below 70% on any unit test, you will be asked to schedule a tutoring session with your instructor to take place within 2 weeks of the test. This session is intended to reinforce topics that you struggled with in order to give yourself the best chance at success in future units.
Wor-Wic Community College Institutional Policies

Academic Honesty Policy

Academic honesty is expected of all students. Students should refer to the “Student Conduct” section of the college catalog for an explanation of the violations of academic values and the procedures that will be followed if a student is charged with one of these primary offenses, which include:

– Cheating
– Plagiarism
– Facilitating academic dishonesty
– Fabrication
– Other forms of academic dishonesty

Blackboard Academic Integrity and Computer Usage Policy

All students logging into Blackboard affirm that they understand and agree to follow Wor-Wic Community College policies regarding academic integrity and the use of College resources as described in the college catalog. Wor-Wic Community College considers the following violations of the computer usage policy:

- Using the campus computing network and facilities to violate the privacy of other individuals
- Sharing of account passwords with friends, family members and any unauthorized individuals

Violators are subject to college disciplinary procedures.

Emergency Information Statement

In the event of severe inclement weather or other emergency, information about the closing of the college will be communicated via Omnilert and the College's website. Faculty will communicate with students about their courses and course requirements, such as assignments, quiz and exam dates, and class and grading policies, via Blackboard. Students will be responsible for completing all assignments in accordance with class policies.

Services for Students with Disabilities

Wor-Wic provides reasonable accommodations for students with disabilities, in compliance with the Americans with Disabilities Act of 1990 and Section 504 of the Rehabilitation Act of 1973. If you are in need of accommodations, please contact the counseling office at (410) 334-2899. For more information, see Wor-Wic's Services for Students with Disabilities web page.

Sexual Violence Disclosures

Wor-Wic Community College seeks a campus free of sexual violence which includes sexual harassment, domestic violence, dating violence, stalking, and/or any form of sex or gender discrimination. Please be aware that if a student discloses a personal experience verbally or in writing as a Wor-Wic student to a faculty or staff member, the employee cannot maintain confidentiality and has the mandatory responsibility to notify one of the college’s Title IX coordinators. However, if you'd like to make a confidential disclosure of any such violence, you can contact Wor-Wic's director of counseling (extension 2900) or you can contact the Life Crisis Center at 410-749-HELP or 2-1-1.

Information on rights of victims of sexual violence and related resources is available in the college catalog and at the Public Safety Page of Wor-Wic’s web page.
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<tr>
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<th>Topic</th>
<th>Date</th>
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<td>Overview</td>
<td>Sept 5</td>
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<td>2</td>
<td>Introduction to Statistics</td>
<td>Sept 10</td>
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<tr>
<td>3</td>
<td>Creating and Interpreting Bar Graphs and Pie Charts</td>
<td>Sept 12</td>
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<td>4</td>
<td>Creating and Interpreting Histograms</td>
<td>Sept 17</td>
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<td>5</td>
<td>Measures of Center and Spread</td>
<td>Sept 19</td>
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<td>6</td>
<td>Role Type Classification – Boxplots and Two-way Tables</td>
<td>Sept 24</td>
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<td>7</td>
<td>Role Type Classification – Scatterplots and Correlation</td>
<td>Sept 26</td>
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<td>8</td>
<td>Sampling Methods and Study Design</td>
<td>Oct 1</td>
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<td>9</td>
<td>Descriptive Statistics Review</td>
<td>Oct 3</td>
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<td>Descriptive Statistics Test</td>
<td>Oct 8</td>
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<td>11</td>
<td>Probability Fundamentals</td>
<td>Oct 10</td>
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<tr>
<td>12</td>
<td>Probability, Center and Spread of Discrete Random Variables</td>
<td>Oct 15</td>
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<td>13</td>
<td>Probability, Center and Spread Binomial Random Variables</td>
<td>Oct 17</td>
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<td>14</td>
<td>Normal Distribution</td>
<td>Oct 22</td>
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<td>Probability Review</td>
<td>Oct 24</td>
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<td>16</td>
<td>Probability Test</td>
<td>Oct 29</td>
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<tr>
<td>17</td>
<td>Sampling Distribution of Proportions</td>
<td>Oct 31</td>
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<td>18</td>
<td>Sampling Distribution of Means</td>
<td>Nov 5</td>
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<td>19</td>
<td>Point and Interval Estimation</td>
<td>Nov 7</td>
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<td>20</td>
<td>Overview of Hypothesis Testing</td>
<td>Nov 12</td>
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<tr>
<td>21</td>
<td>Hypothesis Testing of Proportions</td>
<td>Nov 14</td>
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<td>22</td>
<td>Hypothesis Testing of Means</td>
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<tr>
<td>23</td>
<td>Inferential Statistics Review</td>
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<td>24</td>
<td>Inferential Statistics Test</td>
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Class 25 ........................................................................................................................................... Dec 3
   Class Topic: 2-Sample Hypothesis Testing
Class 26 ........................................................................................................................................... Dec 5
   Class Topic: Exam Review
Final Exam .........................................................................................................................................Dec 12