Department of Mathematics and Statistics  
MTH 220.010—Introduction to Probability and Statistics  
Spring 2019

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Email: rotenberm@sfasu.edu   Phone: 936-468-3709

Class meeting time and place:  Section 010 – MW 1-2:15pm – Math 212

Office Hours:  These hours have been set aside specifically to help students.

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-12</td>
<td>12:15-1:15</td>
<td>10-11</td>
<td>12:15-1:15</td>
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</tbody>
</table>

**Additional times are available by appointment**

Course Description: Probability, random variables, mean and variance, binomial distribution, normal distribution, t distribution, statistical inference and linear regression.

Objectives and Outcomes: A complete list of program learning objectives, general education core curriculum objectives/outcomes and other course information can be found using the following link: http://www2.sfasu.edu/math/courses/syllabi/MTH220Syllabus.pdf

Text and Materials
Textbook bundle: Introductory Statistics (custom published) by Neil A. Weiss This package includes required access to My Stat Lab (online homework). You can also purchase the online access from My Stat Lab (recommended and cheaper). When you purchase the online access through My Stat Lab, you will not have a physical textbook but you will have online access to the textbook.

Case Study Manual (CSM): We will be working through a CSM. There is a PDF of this available on D2L.

Calculator: A scientific calculator is required. Graphing calculators are permitted, but not required. I will be using the TI-84 CE Plus. You must bring your calculator to class daily. You are not allowed to use your phone as a calculator. The use of phones in class is prohibited.

Other Supplies: A 2” binder (at least 2”), dividers, different colored highlighters, paper, and pencils. There will be points deducted for any assignment turned in that is written with anything other than a regular pencil. This is a math class, invest in some pencils (using highlighters/colored pens/colored pencils to help emphasize what you have written is permitted). You will also need to print out class notes from D2L throughout the semester and bring them with you to class. You must keep up with the CSM as we work thorough it.

Course Requirements
D2L
Course materials will be located on D2L. It is your responsibility to check D2L daily. You will use your MySFA username and password on the website www.D2L.sfasu.edu.

MyStatLab
Online homework will be required using My Stat Lab at www.mystatlab.com. When you create an account, use the following course ID: rotenberry18291
There are complete instructions at the end of the syllabus. You need to get your account setup as soon as possible. It is your responsibility to keep up with all due dates. My advice is to check MyStatLab daily. It is extremely important to keep up with the homework on MyStatLab. Due dates on MyStatLab will not be extended. There are several computer labs on campus including at the library for you to use if you have computer problems. At the end of the semester I will drop your 3 lowest homework grades. There will also be suggested problems from the textbook for practice material during the semester.
Exams
There are no make-ups for missed exams. Department policy requires that you bring and be recognizable from either your SFASU Student ID or another valid photo ID before you are permitted to take each exam. You are responsible for all formulas in the course. The final exam is comprehensive and mandatory. You must convey to me that you have a complete understanding of the course material in order to pass the final exam.

Resurrection Policy: This resurrection policy is only used for students with three or fewer absences throughout the semester. Your final exam score can replace your lowest exam score. The final exam score can only replace ONE exam score and it cannot replace any other score.

Projects
To have successful projects, it is crucial to understand the material as we go through the semester. You will receive detailed project instructions later on in the semester.

Quizzes
There are no make-ups for missed quizzes. Quizzes will be at either the beginning or end of class, if you are late to class and miss the quiz, then you missed the quiz and cannot make it up. I will drop two quiz grades at the end of the semester. Quizzes can be announced or unannounced. You need to keep up with the material and come to class prepared each day to take a quiz. Quizzes can be in any form I see appropriate.

Attendance Policy
Attendance is expected and will be taken every class period. You are responsible for any notes and assignments that you miss.

Tutoring
- The AARC (Academic Assistance and Resource Center) in the Steen Library has free tutoring available! They can be reached at 936-468-4108, or the website http://libweb.sfasu.edu/aarc. The AARC also has walk-in tables available for different subjects. The statistics walk-in table has the following hours: Sundays: 4-8 pm, Mondays: 4-7 pm, Tues through Thurs: 2-7 pm.
- SI lead by Melinda Hernandez. SI sessions will be every Thursday from 5-6pm in Math 214 (starting the second week of school). This will be a great resource for you to utilize and does not require you to sign up.
- Learning team with Melinda Hernandez. This is a smaller group that does require a sign up and continued attendance. You will have to sign up for learning teams in person during Open Enrollment on Wednesday and Thursday the first week of school.

Grading Policy
Grade Breakdown
The final course grade will be computed using the following weights:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1 [CO 1,2,3]</td>
<td>15%</td>
</tr>
<tr>
<td>Exam 2 [CO 1,2,3]</td>
<td>15%</td>
</tr>
<tr>
<td>MyStatLab Assignments [CO 1,2,3]</td>
<td>10%</td>
</tr>
<tr>
<td>Projects [CO 1,2,3]</td>
<td>10%</td>
</tr>
<tr>
<td>Quizzes [CO 1,2,3]</td>
<td>25%</td>
</tr>
<tr>
<td>Comprehensive Final Exam [CO 1,2,3]</td>
<td>25%</td>
</tr>
</tbody>
</table>
### Tentative MTH 220 Schedule – Spring 2019

<table>
<thead>
<tr>
<th>Week #</th>
<th>Dates</th>
<th>Material Covered and Exam Schedule</th>
</tr>
</thead>
</table>
| 1      | January 22\(^{nd}\) - 25\(^{th}\) | Course Introduction  
|        |                     | Introduction to Statistics                                      |
| 2      | January 28\(^{th}\) – February 1\(^{st}\)  | Case Study 1                                                   |
| 3      | February 4\(^{th}\)- February 8\(^{th}\)   | Case Study 1                                                   |
| 4      | February 11\(^{th}\)- February 15\(^{th}\) | Case Study 1                                                   |
| 5      | February 18\(^{th}\)- February 22\(^{nd}\)  | Case Study 1                                                   
|        |                     | **Project 1 Due**                                               |
| 6      | February 25\(^{th}\)- March 1\(^{st}\)     | Case Study 1                                                   |
| 7      | March 4\(^{th}\) – March 8\(^{th}\)        | Finish Case Study 1                                            
|        |                     | **Project 1 Presentation**                                     |
| 8      | March 11\(^{th}\) –March 15\(^{th}\)       | **Exam 1**  
|        |                     | Start Case Study 2                                              |
|        |                     | **Spring Break**                                               |
| 9      | March 25\(^{th}\) – March 29\(^{th}\)      | Case Study 2                                                   |
| 10     | April 1\(^{st}\) – April 5\(^{th}\)        | Case Study 2                                                   |
| 11     | April 8\(^{th}\) – April 12\(^{th}\)       | Case Study 2                                                   |
| 12     | April 15\(^{th}\) – April 17\(^{th}\)      | Finish Case Study 2                                            
|        |                     | **Exam 2**  
|        |                     | **No class 4/18 and 4/19 (Easter)**                              |
| 13     | April 22\(^{nd}\) – April 26\(^{th}\)      | Case Study 3A                                                  |
| 14     | April 29\(^{th}\) – May 3\(^{rd}\)         | Case Study 4A                                                  |
| 15     | May 6\(^{th}\) – May 10\(^{th}\)           | **Project 2 Due**                                              |
| 16     | May 13\(^{th}\) – May 17\(^{th}\)          | **Final Exam: Wed. May 15\(^{th}\), 1-3pm**                     |

Case Study 1 consists of Case Study 1A and Case Study 1B  
Case Study 2 consists of Case Study 2A and Case Study 2B  

*See project information sheets for project details.*
The following is an excerpt from SFA Policy 5.4:

The federal definition of a credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally established equivalency that reasonably approximates:

1. Not less than one hour of classroom or direct faculty instruction and a minimum of two hours out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or 10 to 12 weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time, or;
2. At least an equivalent amount of work as outlined in item 1 above for other academic activities as established by the institution including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours.

To this end, all students in courses offered by the Department of Mathematics and Statistics that wish to be successful should plan to spend a minimum of two hours outside of class for every credit hour associated with this course. Expected activities to be completed in the time outside of class include reviewing notes from previous class meetings, reading assigned course resources, completing all assigned exercises and projects, and performing periodic assessment preparation.

See http://www2.sfasu.edu/math/docs/syllabi/MTH220Syllabus.pdf for elements common to all sections.

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Student Registration Instructions

To register for MTH_220:

2. Under Register, select Student .
3. Confirm you have the information needed, then select OK! Register now .
4. Enter your instructor’s course ID: rotenberry18291 , and Continue .
5. Enter your existing Pearson account username and password to Sign In .
   You have an account if you have ever used a MyLab or Mastering product.
   - If you don’t have an account, select Create and complete the required fields.
6. Select an access option:
   - Enter the access code that came with your textbook or that you purchased separately from the bookstore.
   - If available for your course:
     • Buy access using a credit card or PayPal.
     • Get temporary access.
7. From the You’ve Done it page, select Go To My Courses .
8. On the My Courses page, select the course name MTH_220 to start your work.

To sign in later:

2. Select Sign In .
3. Enter your Pearson account username and password, and Sign In .
4. Select the course name MTH_220 to start your work.

To upgrade temporary access to full access:

2. Select Sign In .
3. Enter your Pearson account username and password, and Sign In .
4. Select Upgrade access for MTH_220 .
5. Enter an access code or buy access with a credit card or PayPal.

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**Course description:** Probability, random variables, mean and variance, binomial distribution, normal distribution, statistical inference and linear regression.

**Core Objectives (CO):**

1. **Critical Thinking** [CO 1]: to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
2. **Communication Skills** [CO 2]: to include effective development, interpretation and expression of ideas through written, oral and visual communication
3. **Empirical and Quantitative Skills** [CO 3]: to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions

**Credit hours:** 3

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The federal definition of a credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally established equivalency that reasonably approximates:

1. Not less than one hour of classroom or direct faculty instruction and a minimum of two hours out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or 10 to 12 weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time, or;
2. At least an equivalent amount of work as outlined in item 1 above for other academic activities as established by the institution including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours.

To this end, all students in courses offered by the Department of Mathematics and Statistics that wish to be successful should plan to spend a minimum of two hours outside of class for every credit hour associated with this course. Expected activities to be completed in the time outside of class include reviewing notes from previous class meetings, reading assigned course resources, completing all assigned exercises and projects, and performing periodic assessment preparation.

**Course Prerequisites and Corequisites:** See general course prerequisites.

**General Education Core Curriculum:** This course has been selected to be part of SFA’s core curriculum. The Texas Higher Education Coordinating Board has identified six objectives for all core courses: Critical Thinking Skills, Communication Skills, Empirical and Quantitative Skills, Teamwork, Personal Responsibility, and Social Responsibility. SFA is committed to the improvement of its general education core curriculum by regular assessment of student performance on these six objectives. Assessment of these objectives at SFA will be based on student work from all core curriculum courses. This student work will be collected in D2L, the assessment management system selected by SFA to collect student work for core assessment.

The chart below indicates the core objectives identified by SFA to be assessed in this course. The instructor of each section of the course will provide the assignment(s) that will be used to assess the objectives as well as the date(s) by which the assignments must be completed and uploaded in D2L.

<table>
<thead>
<tr>
<th>Core Objective</th>
<th>Definition</th>
<th>Course Assignment Title</th>
<th>Date Due in D2L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Thinking Skills</td>
<td>To include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information.</td>
<td>The instructor of each section will determine the assignment for this assessment.</td>
<td>Only assessed in fall of odd years. (See instructor for due date(s).)</td>
</tr>
</tbody>
</table>
Course outline:

- Descriptive Statistics [CO 1, 2, 3]
  - Graphical Display of Data
  - Measures of location
  - Measures of Dispersion

- Probability [CO 1, 2, 3]
  - Classical Probability
  - Probability Laws (Rules)
  - Counting Techniques

- Probability Distributions [CO 1, 2, 3]
  - Random Variables
  - Discrete Distributions
    - Binomial Distribution
    - Hypergeometric Distribution
  - Continuous Distributions
    - Uniform Distribution
    - Normal Distribution

- Sampling Distributions [CO 1, 2, 3]
  - Random Samples
  - Central Limit Theorem

- Statistical Inference [CO 1, 2, 3]
  - Estimation
    - Point Estimation
    - Interval Estimation
  - Hypothesis Testing

- Linear Regression [CO 1, 2, 3]

Approximate time spent:

- Descriptive Statistics: 10%
- Probability: 20%
- Probability Distributions: 20%
- Sampling Distributions: 10%
- Statistical Inference: 30%
- Linear Regression: 5%

Explicit instruction in Critical Thinking, Communication and Empirical and Quantitative Reasoning is in addition to implicit instruction, modeling and practice that occur daily in the discussion of limits and continuity, derivatives and antiderivatives, applications of derivatives and definite integration. This explicit instruction includes explanation of solving mathematical problems by thinking critically, communicating logically ordered solutions with complete and correct notation, and applying empirical or quantitative skills as appropriate to the problem.

Academic Integrity

Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

The penalty for a student found cheating on any part of an assignment, quiz, or exam in this class will range from a grade of zero on the work to a grade of F in the course, and may result in additional, more severe disciplinary measures. A student who allows another to copy his work and the student copying the work are both guilty of cheating. Do your own work. Do not show your completed work to others. Do not allow others to copy your work.

Definition of Academic Dishonesty (SFA policy 4.1):

Academic dishonesty includes both cheating and plagiarism. Cheating includes, but is not limited to:

- using or attempting to use unauthorized materials on any class assignment or exam;
- falsifying or inventing of any information, including citations, on an assignment;
- helping or attempting to help other student(s) in an act of cheating or plagiarism.

sfasu.edu/math
Plagiarism is presenting the words or ideas of another person as if they were one’s own. Examples of plagiarism include, but are not limited to:
- submitting an assignment as one’s own work when it is at least partly the work of another person;
- submitting a work that has been purchased or otherwise obtained from the Internet or another source;
- incorporating the words or ideas of an author into one's paper or presentation without giving the author credit.

**Withheld Grades Semester Grades (SFA Policy 5.5)**
Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average. The circumstances precipitating the request must have occurred after the last day in which a student could withdraw from a course. Students requesting a WH must be passing the course with a minimum projected grade of C.

**Students with Disabilities**
To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to [http://www.sfasu.edu/disabilityservices](http://www.sfasu.edu/disabilityservices).

**Acceptable Student Behavior**
Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy 10.4). Un acceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed.

**Student Learning Outcomes (SLO):** At the end of MTH 220, a student who has studied and learned the material should be able to:

1. Exhibit an understanding of basic probability rules and concepts  [CO:1,3]
2. Demonstrate an understanding of different probability models and ways they are used in statistical inference. [CO: 1, 2, 3]
3. Demonstrate an understanding of point estimation of population parameters. [PLO: 1,3]
4. Demonstrate an understanding of interval estimation about population parameters and inference that can be drawn from such techniques. [CO: 1,3]
5. Demonstrate an understanding of hypothesis testing concerning population parameters and inference that can be drawn from such techniques. [CO:1,3]

*There are no specific program learning outcomes for this major addressed in this course. It is a general education core curriculum course and/or a service course.*

*Date of document: 01/11/2019*