Department of Mathematics and Statistics
MATH 1342.503—Introduction to Probability and Statistics (Online)
Fall 2021

Instructor: Brooke Busbee   Email: busbeeb@sfasu.edu   Class Times & Place: This class is completely online

Office Hours: Monday – No Office Hours
MATH 339 Tuesday: 3:30 – 5:00 pm
                  Wednesday: 10:00 – 11:00 am
                  Thursday: 10:45 am – 12:15 pm
                  Friday: 10:00 – 11:00 am
Use the following link to Zoom in for office hours: https://sfasu.zoom.us/my/busbeeb
Passcode: 138220   Meeting ID: busbeeb

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

Text and Materials: Discovering Statistics (Bundle) by Hawkes and Marsh, 3rd Edition.
Online access to the Hawkes Learning System is required. You can gain access by either using the access code from the bundle or by purchasing access from Hawkes. You will also need a scientific calculator. I will be using the TI-30XS MultiView. A graphing calculator is permitted but not required. Please make sure that you are comfortable with the calculator that you select.

Attendance Policy
This is an online class. You are responsible for all due dates and material. Please use the calendars located at the end of the syllabus to help you stay on track.

Grading Policy:

<table>
<thead>
<tr>
<th>Course Component</th>
<th>Percentage</th>
<th>Exam Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hawkes Lessons</td>
<td>25%</td>
<td>All material covered from 1.1 through 4.3 (see schedule for a detailed list of sections)</td>
</tr>
<tr>
<td>WebTest 1</td>
<td>15%</td>
<td>All material covered from 1.1 through 4.3 (see schedule for a detailed list of sections)</td>
</tr>
<tr>
<td>WebTest 2</td>
<td>15%</td>
<td>All material covered from 1.1 through 8.2 (see schedule for a detailed list of sections)</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>20%</td>
<td>All material covered from 8.3-11.4b (see schedule for a detailed list of sections)</td>
</tr>
<tr>
<td>Comprehensive Final Exam</td>
<td>25%</td>
<td>All material covered in the course The final exam is comprehensive (see schedule for a detailed list of sections)</td>
</tr>
</tbody>
</table>

Grading Scale:
90% - 100%: A
80% - 90%: B
70% - 80%: C
60% - 70%: D
Below 60%: F

Course Requirements
• Hawkes Lessons—The lesson schedule is located at the end of the syllabus. [CO 1, 2, 3]
• Two WebTests—The WebTests are designed to make sure that you are keeping up with the material. These are online tests through Hawkes. Additional information about the WebTests can be found later in the syllabus. [CO 1, 2, 3]
• Midterm Exam—The midterm exam is an online exam through Hawkes. [CO 1, 2, 3]
• Comprehensive Final Exam—The final exam is an online exam through Hawkes [CO 1, 2, 3]
• Student Responsibility—It is your responsibility to keep up with all due dates and exam dates. It is your responsibility to check Hawkes and d2l daily.

Exam Calendar and Information:

<table>
<thead>
<tr>
<th>Exam</th>
<th>Due Date</th>
<th>Exam Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>WebTest 1</td>
<td>September 14th</td>
<td>All material covered from 1.1 through 4.3 (see schedule for a detailed list of sections)</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>October 5th</td>
<td>All material covered from 1.1 through 8.2 (see schedule for a detailed list of sections)</td>
</tr>
<tr>
<td>WebTest 2</td>
<td>November 18th</td>
<td>All material covered from 8.3-11.4b (see schedule for a detailed list of sections)</td>
</tr>
<tr>
<td>Final Exam</td>
<td>December 7th</td>
<td>All material covered in the course The final exam is comprehensive (see schedule for a detailed list of sections)</td>
</tr>
</tbody>
</table>

AARC Tutoring: The AARC (Academic Assistance and Resource Center) in the Steen Library has free help available! The AARC is also available through Zoom. Please go to the following website to get up to date information about getting help through the AARC: http://www.sfasu.edu/aarc/tutoring
Hawkes Learning System Lessons:

The Hawkes lessons are how you will learn and gain confidence in the material for this course. These lessons play the role of lecture and homework in a face-to-face class. There are 26 total lessons to complete on Hawkes. Your two lowest Hawkes lessons will be dropped. Each time you work through a lesson, you will work through the lesson in three parts: learn, practice, certify.

1. Part 1: Learn
   The first part of the Hawkes lesson plays the role of the lecture that you would have in a face-to-face course. This part will introduce you to the material covered in that sections. You will see examples completed step by step.

2. Part 2: Practice
   The second part of the lesson allows you to practice with what you just learned. This part allows you to gain confidence in the new material.

3. Part 3: Certify
   The final part is where you get your grade for the lesson. You must certify each lesson in order to get a grade. Once you certify each lesson, your grade for that lesson is 100%. You will see a required mastery for each lesson. This tells you how many questions you need to get correct in order to master the lesson. Once you have mastered the lesson, it is certified and your grade for that lesson is 100%. For example, if it says that the required mastery is 10 out of 13 then once you get 10 questions right, you have certified the lesson.

Note: You can go through any of the three parts as many times as you want

Due dates are posted on the schedule at the end of the syllabus as well as on the Hawkes Learning System. On the scheduled due date, the assignment is due at 11:59 pm. The following is information for the penalty when completing a Hawkes lesson after the stated due date:

1 day late: 0% penalty (This is to allow you flexibility with the due dates of the lessons)
2 days late: 0% penalty (This is to allow you flexibility with the due dates of the lessons)
3 days late: 25% penalty
4 days late: 50% penalty
5 days late: 75% penalty
More than 5 days late: 100% penalty
Note: this penalty structure is only for the Hawkes lessons

You need to figure out blocks of time throughout the week that you plan to work on the lessons. Do NOT wait until the due date to try and complete the lessons due that day. Any Hawkes work done after December 7th will not count. You need to pace yourself in order to successfully complete the lessons for that week. You should always try to stay at least a lesson ahead of schedule. One lesson might take you longer than another one.

Miscellaneous:

- It is your responsibility to keep up with all due dates for the course. It takes dedication and time management to succeed in an online course.

- It is your responsibility to check D2L (https://d2l.sfasu.edu/) and Hawkes on a daily basis. You are responsible for anything posted on D2L or on Hawkes.

- I like to use D2L for storage and communication. I will store course files on D2L like the syllabus, formula sheet, and tables. I put announcements on the D2L newsfeed. You will spend most of your time in this course on the Hawkes Learning System.

- Email is the easiest way to get in touch with me. My email address is busbeeb@sfasu.edu

See http://www3.sfasu.edu/math/docs/syllabi/MATH1342Syllabus.pdf for elements common to all sections
Exam Dates and Information
Fall 2021

• **WebTest 1:**
  - WebTest 1 is to be completed online through Hawkes
  - WebTest 1 covers our lessons in chapters 1 through 4 (see schedule on next page)
  - WebTest 1 is due September 14th by 11:59 pm
  - Once you have finished the lessons on WebTest 1, you will want to do the following:
    ▪ Review the lessons
    ▪ Complete the practice for WebTest 1 on Hawkes (under the test tab)
    ▪ Complete WebTest 1
  - You have one attempt at WebTest 1
  - You will receive your score on this WebTest immediately after it is submitted. You will then be allowed to review the WebTest starting September 16th.

• **Midterm Exam:**
  - The midterm exam is to be completed online through Hawkes
  - The midterm covers all lessons covered so far this semester through 8.2 (see schedule)
  - The midterm exam is due October 5th by 11:59 pm
  - You need to have a copy of the formula packet and tables printed off of D2L.
  - You will receive your score on this midterm immediately after it is submitted. You will then be allowed to review the midterm starting October 7th.

• **WebTest 2:**
  - WebTest 2 is to be completed online through Hawkes
  - WebTest 2 covers all lessons covered from 8.3-11.4b (see schedule on next page)
  - WebTest 2 is due November 18th by 11:59 pm
  - Once you have finished the lessons on WebTest 2, you will want to do the following:
    ▪ Review the lessons
    ▪ Complete the practice for WebTest 2 on Hawkes (under the test tab)
    ▪ Complete WebTest 2
  - You have one attempt at WebTest 2
  - You will receive your score on this WebTest immediately after it is submitted. You will then be allowed to review the WebTest starting November 30th.
  - You need to have a copy of the formula packet and tables printed off of D2L.

• **Final Exam:**
  - The final exam is to be completed online through Hawkes
  - The final covers all lessons covered in this course (see schedule)
  - The final exam is due December 7th by 11:59 pm
  - You need to have a copy of the formula packet and tables printed off of D2L.
## Fall 2021 Lesson Due Date Schedule

<table>
<thead>
<tr>
<th>Lesson Name</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1-1.8 Introduction to Statistical Thinking</td>
<td>8/24</td>
</tr>
<tr>
<td>2.2 Data Classification</td>
<td>8/26</td>
</tr>
<tr>
<td>3.1 Frequency Distributions</td>
<td>8/31</td>
</tr>
<tr>
<td>3.4 Histograms and Other Graphical Displays</td>
<td>9/2</td>
</tr>
<tr>
<td>4.1 Measures of Location</td>
<td>9/7</td>
</tr>
<tr>
<td>4.2 Measures of Dispersion</td>
<td>9/7</td>
</tr>
<tr>
<td>4.3 Measures of Relative Position, Box Plots, and Outliers</td>
<td>9/9</td>
</tr>
<tr>
<td>6.1 Introduction to Probability</td>
<td>9/16</td>
</tr>
<tr>
<td>7.1 Types of Random Variables</td>
<td>9/21</td>
</tr>
<tr>
<td>7.2 Discrete Random Variables</td>
<td>9/21</td>
</tr>
<tr>
<td>7.4 The Binomial Distribution</td>
<td>9/23</td>
</tr>
<tr>
<td>8.2 The Normal Distribution</td>
<td>9/28</td>
</tr>
<tr>
<td>8.3 The Standard Normal Distribution</td>
<td>10/7</td>
</tr>
<tr>
<td>8.4 Applications of the Normal Distribution</td>
<td>10/12</td>
</tr>
<tr>
<td>9.3 The Distribution of the Sample Mean and the Central Limit Theorem</td>
<td>10/14</td>
</tr>
<tr>
<td>9.4 The Distribution of the Sample Proportion</td>
<td>10/19</td>
</tr>
<tr>
<td>10.2 Interval Estimation of the Population Mean</td>
<td>10/21</td>
</tr>
<tr>
<td>10.3 Estimating the Population Proportion</td>
<td>10/26</td>
</tr>
<tr>
<td>11.1 Introduction to Hypothesis Testing</td>
<td>10/28</td>
</tr>
<tr>
<td>11.2a Testing a Hypothesis about a Population Mean with Sigma Known</td>
<td>11/2</td>
</tr>
<tr>
<td>11.2b Testing a Hypothesis about a Population Mean with Sigma Unknown</td>
<td>11/4</td>
</tr>
<tr>
<td>11.2c Testing a Hypothesis about a Population Mean using P-values</td>
<td>11/9</td>
</tr>
<tr>
<td>11.4a Testing a Hypothesis about a Population Proportion</td>
<td>11/11</td>
</tr>
<tr>
<td>11.4b Testing a Hypothesis about a Population Proportion using P-values</td>
<td>11/16</td>
</tr>
<tr>
<td>5.1 Scatterplots and Correlation</td>
<td>12/2</td>
</tr>
<tr>
<td>5.2 Fitting a Linear Model</td>
<td>12/2</td>
</tr>
</tbody>
</table>

- My advice is to always stay at least one lesson ahead of schedule.
How to Setup Hawkes

NEW STUDENTS

1. Go to https://learn.hawkeslearning.com
2. Click Create an Account
3. Choose one of the following:

   - Complete the account creation steps.

4. If you selected Temporary Access, to make your account permanent:

   5. Click Activate. Note: you are able to click here, even if your temporary access code has expired.

6. Using the pop-up window, complete one of the following steps:

   If you have purchased a license number from the bookstore, type it in and click Activate Now.

   If you need to purchase your materials, click Purchase Online to do so with a credit card.

RETURNING STUDENTS

1. Sign in to your account at https://learn.hawkeslearning.com
2. Locate the product being used in this course on your Dashboard and click Upgrade. **If you do not see Upgrade on your Dashboard, click Enroll, select the following for both your instructor and section: Upgrade to New Edition, and click Enroll. Then select Upgrade.

3. Upon selecting Upgrade, you will be prompted to enroll into your course. Select your instructor name and section, then click Enroll.

4. This will complete the process, and you will see your upgraded access to the new edition courseware on your Dashboard.

WE CAN HELP

If you have any questions about your account, please contact Hawkes Technical Support:

1-800-426-9538

Monday–Friday, 8:00a.m.–10:00p.m. ET

Online Chat

http://chat.hawkeslearning.com

24 hours a day, 7 days a week
Math 1342 – Introduction to Probability and Statistics
Course Syllabus

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

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.

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.

By enrolling in MATH 1342 Introduction to Probability and Statistics you are also enrolling in a Core Curriculum Course that fulfills the Mathematics Core Objective requirement.

The chart below indicates: (a) The core objectives that are required to be taught in this course per the Texas Higher Education Coordinating Board (THECB), (b) How the required core objectives will be addressed.
Core Curriculum Objective Table

<table>
<thead>
<tr>
<th>Core Objective</th>
<th>Definition</th>
<th>How the Core Objective Will be Addressed.</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>Case study 1A</td>
</tr>
<tr>
<td>Communication Skills</td>
<td>To include effective development, interpretation and expression of ideas though written, oral, and visual communication.</td>
<td>Hypothesis testing in Case study 2A and 2B</td>
</tr>
<tr>
<td>Empirical and Quantitative Skills</td>
<td>To include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions.</td>
<td>Case study 2A</td>
</tr>
</tbody>
</table>

Course outline:

- Descriptive Statistics [CO 1, 2, 3] 10%
  - Graphical Display of Data
  - Measures of location
  - Measures of Dispersion
- Probability [CO 1, 2, 3] 20%
  - Classical Probability
  - Probability Laws (Rules)
  - Counting Techniques
- Probability Distributions [CO 1, 2, 3] 20%
  - Random Variables
  - Discrete Distributions
    - Binomial Distribution
    - Hypergeometric Distribution
  - Continuous Distributions
    - Uniform Distribution
    - Normal Distribution
- Sampling Distributions [CO 1, 2, 3] 10%
  - Random Samples
  - Central Limit Theorem
- Statistical Inference [CO 1, 2, 3] 30%
  - Estimation
    - Point Estimation
    - Interval Estimation
  - Hypothesis Testing
- Linear Regression [CO 1, 2, 3] 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.
problems by thinking critically, communicating logically ordered solutions with complete and correct notation, and applying empirical or quantitative skills as appropriate to the problem. 5%

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 any information, including citations, on an assignment;
- helping or attempting to help other student(s) in an act of cheating or plagiarism.

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.

SFASU Mental Health Statement: SFASU values students’ mental health and the role it plays in academic and overall student success. SFA provides a variety of resources to support students mental health and wellness. Many of these resources are free, and all of them are confidential.

On-campus Resources:
SFASU Counseling Services
sfasu.edu/math
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). Unacceptable 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: 08/09/2021