Department of Mathematics and Statistics
Math 1342.014—Introduction to Probability and Statistics – Spring 2024

Name: Dr. Kent Riggs          Email: riggske@sfasu.edu          Phone: 936-468-6263

Office: 350 Bush Mathematical Sciences Building   Office Hours: 9-11:30 on MW and by appointment

Class Meeting Place and Time: Bush Math Building Room 216   TuTh: 12:30-1:45

Course Description: Probability essential for statistics, random variables, mean and variance, binomial distribution, normal distribution, t distribution, descriptive statistics, process of statistical inference, confidence intervals, hypothesis testing and linear regression

Text and Materials:

This is an open-source textbook that can be accessed with the following link:
https://mostlyharmlesstat.wixsite.com/webpage/textbook

Excel: Calculations for this course will be done through a calculator or Microsoft Excel. As a student, you are able to download Excel through your mySFA account. There are computer labs available on campus if needed. You will also need to bring a hand-held, non-internet based calculator with you to every class. I recommend a scientific or graphing calculator, but a four-function calculator is sufficient.

Attendance Policy: Attendance is expected and will be reflected in everything you submit. It will be increasingly difficult to get a good grade or even pass if you miss class regularly. When a student misses’ class, he or she is expected to proactively and promptly acquire the missed information before the next calendar class day.

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

Grading Policy:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework/Quizzes</td>
<td>15%</td>
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<tr>
<td>Exam 1</td>
<td>20%</td>
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<td>Exam 2</td>
<td>20%</td>
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<tr>
<td>Exam 3</td>
<td>20%</td>
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<tr>
<td>Final Exam</td>
<td>25%</td>
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Grading Scale:

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

Course Requirements:

- Exams: Exams will be given during your scheduled class time in our regular classroom. There are no make-ups for missed exams. The final exam is comprehensive and mandatory. You must have a complete understanding of the course material in order to pass the final exam.

- Homework/Quizzes: HW will be administered through D2L, while quizzes will be given during classtime.

- Daily Responsibilities: Each day you need to reread your course notes, work on available homework, check D2L for any announcements and newmaterial, and to complete any assigned tasks. Also check D2L before coming to class in case there is a change in class for that day. It is extremely important in this course to stay organized with your notes.

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. You are responsible for everything that is posted on D2L for this course. I will use the D2L newsfeed as an easy way to communicate with the class.

See https://math.sfasu.edu/docs/syllabi/MATH1342Syllabus.pdf for elements common to all sections.
<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Section</th>
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<tbody>
<tr>
<td>1 and 2</td>
<td>1/18-1/27</td>
<td>1.1 - Introduction</td>
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<td>1.2 – Samples vs. Populations</td>
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<td>1.3 – Collecting Data &amp; Data Types</td>
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<td>2.1 – Introduction</td>
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<td>2.2 – Tabular Displays</td>
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<td>2.3 – Graphical Displays</td>
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<tr>
<td>3</td>
<td>1/29-2/2</td>
<td>3.1 – Measures of Center</td>
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<td>3.2 – Measures of Spread</td>
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<td>3.3 – Measures of Placement</td>
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<tr>
<td>4</td>
<td>2/5-2/9</td>
<td>4.1 – Probability Introduction</td>
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<td>4.2 – Three Types of Probability</td>
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<td>4.3 – Complement Rule</td>
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<td>4.4 – Union and Intersection</td>
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<td>4.5 – Independent Events</td>
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<td>4.6 – Conditional Probability</td>
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<td>4.7 – Counting Rules</td>
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<td>5</td>
<td>2/12-2/16</td>
<td>Catch Up and Exam 1</td>
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<td>6</td>
<td>2/19-2/23</td>
<td>5.1 – Discrete Prob. Dist. Introduction</td>
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<td>5.2 – Discrete Probability Distributions</td>
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<td>5.4 – Binomial Distributions</td>
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<td>6.1 - Continuous Prob. Dist. Introduction</td>
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<td>6.4 – Normal Distribution</td>
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<td>7</td>
<td>2/26-3/1</td>
<td>6.5 – Central Limit Theorem</td>
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<td>7.1 – Confidence Interval Introduction</td>
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<td>7.2 – Confidence Interval for a Proportion</td>
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<td>8</td>
<td>3/4-3/8</td>
<td>7.4 – CI for a Mean (z-interval)</td>
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<td>7.5 – Interpreting a Confidence Interval</td>
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<td>7.7 – CI for a Mean (t-interval)</td>
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<td>SPRING BREAK</td>
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<td>9</td>
<td>3/18-3/22</td>
<td>Catch Up and Exam 2</td>
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<td>10</td>
<td>3/25-3/29</td>
<td>8.1 – Hypothesis Test Introduction</td>
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<td>8.2 – Type I and II Errors</td>
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<td>Easter Break – No Class on 3/28</td>
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<td>11</td>
<td>4/1-4/5</td>
<td>8.3 – HT for a Mean</td>
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<td>8.4 – HT for a Proportion</td>
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<td>12</td>
<td>4/8-4/12</td>
<td>9.1 – Two Population CI and HT</td>
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<td>9.3.2 – Pooled HT and CI for Two Population Means</td>
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<td>9.4 - HT and CI for Two Proportions</td>
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<tr>
<td>13</td>
<td>4/15-4/19</td>
<td>Catch Up and Exam 3</td>
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<tr>
<td>14</td>
<td>4/22-4/26</td>
<td>12.1 - Correlation</td>
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<td>12.2 – Simple Linear Regression</td>
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<tr>
<td>15</td>
<td>4/29-5/3</td>
<td>Catch Up and Review</td>
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<tr>
<td>16</td>
<td>5/6-5/10</td>
<td>Final Exam at 10:30 am – 12:30 pm on May 9</td>
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</tbody>
</table>
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]
  - Graphical Displays of Data
  - Measures of Location, Dispersion, and Position
- Sampling Distributions [CO 1, 2, 3]
  - Random Variables and Samples
  - Binomial Distribution
  - Normal Distribution
  - Student’s-t Distribution
  - Central Limit Theorem
- Statistical Inference [CO 1, 2, 3]
  - Hypothesis Testing
  - Estimation
    - Point Estimation
    - Interval Estimation
- Simple Linear Regression [CO 1, 2, 3]

Approximate time spent

- 10%
- 20%
- 60%
- 10%

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 the bulleted content. 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.

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.

Academic Integrity

The Code of Student Conduct and Academic Integrity outlines the prohibited conduct by any student enrolled in a course at SFA. It is the responsibility of all members of all faculty, staff, and students to adhere to and uphold this policy.

Articles IV, VI, and VII of the new Code of Student Conduct and Academic Integrity outline the violations and procedures concerning academic conduct, including cheating, plagiarism, collusion, and misrepresentation. Cheating includes, but is not limited to: (1) Copying from the test paper (or other assignment) of another student, (2) Possession and/or use during a test of materials that are not authorized by the person giving the test, (3) Using, obtaining, or attempting to obtain by any means the whole or any part of a non-administered test, test key, homework solution, or computer program, or using a test that has been administered in prior classes or semesters without permission of the Faculty member, (4) Substituting for another person, or permitting another person to substitute for one’s self, to take a test, (5) Falsifying research data, laboratory reports, and/or other records or academic work offered for credit, (6) Using any sort of unauthorized resources or technology in completion of educational activities.

Plagiarism is the appropriation of material that is attributable in whole or in part to another source or the use of one’s own previous work in another context without citing that it was used previously, without any indication of the original source, including words, ideas, illustrations, structure, computer code, and other expression or media, and presenting that material as one’s own academic work being offered for credit or in conjunction with a program course or degree requirements.

Collusion is the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any provision of the rules on academic dishonesty, including disclosing and/or distributing the contents of an exam.

Misrepresentation is providing false grades or résumés; providing false or misleading information in an effort to receive a postponement on an extension on a test, quiz, or other assignment for the purpose of obtaining an academic or financial benefit for oneself or another individual or to injure another student academically or financially.

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. For additional information, go to https://www.sfasu.edu/policies/course-grades-5.5.pdf.

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.

Student Wellness and Well-Being
SFA values students’ overall well-being, mental health and the role it plays in academic and overall student success. Students may experience stressors that can impact both their academic experience and their personal well-being. These may include academic pressure and challenges associated with relationships, emotional well-being, alcohol and other drugs, identities, finances, etc.
If you are experiencing concerns, seeking help, 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:**
The Dean of Students Office (Rusk Building, 3rd floor lobby)
www.sfasu.edu/deanofstudents
936.468.7249
dos@sfasu.edu

SFA Human Services Counseling Clinic Human Services, Room 202
www.sfasu.edu/humanservices/139.asp
936.468.1041

The Health and Wellness Hub “The Hub”
Location: corner of E. College and Raguet St.

To support the health and well-being of every Lumberjack, the Health and Wellness Hub offers comprehensive services that treat the whole person – mind, body and spirit. Services include:

- Health Services
- Counseling Services
- Student Outreach and Support
- Food Pantry
- Wellness Coaching
- Alcohol and Other Drug Education

www.sfasu.edu/thehub
936.468.4008
thehub@sfasu.edu

**Crisis Resources:**

- Burke 24-hour crisis line: 1.800.392.8343
- National Suicide Crisis Prevention: 9-8-8
- Suicide Prevention Lifeline: 1.800.273.TALK (8255)
- Crisis Text Line: Text HELLO to 741-741

**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.

*Date of document: 08/23/2023*