I. COURSE INFORMATION

Instructor: Sherry L. Bair, Ph.D.
E-mail: sherry.bair@tamucc.edu
Office location: Center for Instruction 360
Office phone: 361-825-2189
Office hours: Mon-Thurs 12:30 - 2 p.m.; also by appointment

Meeting place: CS107
Meeting times: 8:30-11:30 on June 9-12, June 16-20, & June 23-24
9-4 on June 13

II. COURSE DESCRIPTION

Catalog Description:
An investigation of the principles and applications of probability and descriptive and inferential statistics.

As suggested by the above catalog description, this course centers on the investigation of random patterns and the principles and applications of probability and -descriptive and inferential- statistics. This course is designed for the professional development of teachers and provides an advanced perspective on the concepts in school probability and statistics.

III. PREREQUISITES for the COURSE

Graduate status.

IV. REQUIRED TEXTBOOKS and OTHER MATERIALS

Required:
- A graphing calculator
- Regular access to high speed internet

Additional problem sets, tasks, and readings as assigned.

V. CONTENT TOPICS AND STUDENT LEARNING OUTCOMES

Probability and Randomness:
- Basic concepts and principles
- Probability distributions & applications of the Normal distribution
- Applications

Statistics:
- Basic concepts of sampling and experimental design
- Descriptive Statistics
  - Frequency distributions and graphs
  - Central tendency, dispersion and relative position indicators
• Correlation and contingency
• Inferential Statistics
  o Hypothesis testing with one and two samples
  o Tests of linearity
  o Tests of independence
• Statistical Modeling and Experimental Design

On completion of the course students will be expected to:
1. Recognize and work with random variables, calculate probabilities and work with sampling distributions of such variables.
2. Apply probability concepts and rules to the solution of realistic situations.
3. Design experiments to answer research questions, and calculate and interpret descriptive statistics for research variables.
4. State research hypotheses and conduct statistical computations to test the viability of such hypotheses; of particular importance, those related to the learning scenario.
5. Summarize experimental findings, and synthesize these results in to research reports, make inferences and analyze implications.

VI. INSTRUCTIONAL METHODS and ACTIVITIES
The course will be a combination of instructional presentation of new material and concepts, whole-class discussion, individual investigations of mathematics, and optional one-on-one discussion time between students and the instructor outside of class. Students may be required to give individual or group presentations. All participants are expected to engage in group and whole class activities by contributing knowledge and thoughtful evaluation of others’ contributions.

VII. MAJOR COURSE REQUIREMENTS and ASSESSMENTS
Final course grades will be a weighted average of mean scores using the following weights:

Daily work and assignments  20%
Projects (2)              30%
Quizzes                  20%
Final Exam               30%

Each item, except the computational and core skills exam, will be graded in a holistic manner, based on a rubric. A general version of the rubric appears below. Each item is scored on a basis of 0 to 4 points. At the end of the semester grades are calculated in a manner similar to grade point average, weighting the mean score in each category and using the following guidelines for determining semester grades: A (3.4 – 4.0), B (2.75 – 3.4), C (2.0 – 2.74), D (1.5 – 1.99), F (0 – 1.49). This scale makes a full distribution of grades from A to F plausible, with A’s being reserved for truly outstanding performance and a grade of C representing the minimal acceptable performance.

• A (4)-Outstanding performance. Student demonstrates solid conceptual understanding and insight. All required components are clearly present. Material is well written, demonstrating coherent thoughts and reasoning as well as utilizes proper grammar, correct spelling, appropriate mathematical terminology, and notation.

• B (3)-Good performance. Student demonstrates good understanding and insight. All required components are present. Material is well written, demonstrating coherent thoughts and reasoning.
Student uses appropriate mathematical terminology and notation, minor spelling or grammatical errors are possible.

- **C (2)-Adequate performance.** Student demonstrates adequate understanding and insight. Most required components are present. Material is written coherently, demonstrating adequate writing skills, but may contain numerous grammatical or spelling errors. Students may not use appropriate mathematical terminology, but does not misuse mathematical terminology or notation.

- **D (1)-Inadequate performance.** Student demonstrates inadequate understanding and insight. Required components are not present. Writing indicates little thought and reflection, or is of poor quality, making it difficult to read and understand. Students may have misused mathematical terms or notation.

- **F (0)-Unacceptable effort & performance.** Student demonstrates little to no understanding of the content. Work is not turned in, or most of the required components are missing. Writing indicates virtually no effort.

**Daily Work and assignments**—participate in inquiry tasks, whole-class discussion, and group work activities during regularly scheduled class time, and complete assigned tasks outside of classtime.

**Projects**—Two projects will be required. One is related to professional development and requires attendance at the Me by the Sea Conference. The second will require further research and reading professional literature with respect to the teaching and learning of a specific content topic in probability or statistics, and then creating an inquiry-based activity to use to teach the concept. Individual project guidelines and assessment details will be provided.

**Quizzes**—Demonstrate your mastery of student learning outcomes through 30-45 minute assessments during the course.

**Final Exam**—Complete a comprehensive summative evaluation of your knowledge through a final exam. The final exam cannot be made-up if missed. If you have a conflict with the scheduled final exam time, please contact me at least one week prior to discuss scheduling options.

» The final exam is scheduled for **Tuesday, June 24 at 8:30 - 11:30am.**
VIII. COURSE OUTLINE (tentative – all changes will be announced in class)

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<thead>
<tr>
<th>Day</th>
<th>TOPIC</th>
<th>CONTENT</th>
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<tbody>
<tr>
<td>Mon, 6/9</td>
<td>Intro to course and data types</td>
<td>Beginning assessment and discussion about TEKS changes in probability and statistics &amp; Chapter 1</td>
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<tr>
<td>Tue, 6/10</td>
<td>Displaying data &amp; descriptive statistics</td>
<td>Chapter 2 &amp; 3</td>
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<tr>
<td>Wed, 6/11</td>
<td>Correlation &amp; lines of best fit</td>
<td>Chapter 4</td>
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<tr>
<td>Thu, 6/12</td>
<td>Project #1 introduction</td>
<td>Data Representation (chpt 1-4) <strong>Quiz #1</strong></td>
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<tr>
<td>Fri, 6/13</td>
<td>Probability &amp; Stats in the schools</td>
<td><strong>ME by the Sea Conference (8:30 AM – 4 PM)</strong></td>
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<tr>
<td>Mon, 6/16</td>
<td>Probability concepts</td>
<td><strong>Project #1 due at 8:30 am - Chapter 5</strong></td>
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<td>Tue, 6/17</td>
<td>Counting Techniques</td>
<td>Chapter 6</td>
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<td>Wed, 6/18</td>
<td>Random variables &amp; Probability Distributions</td>
<td>Chapter 7 &amp; 8</td>
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<td>Thu, 6/19</td>
<td>Sampling and distributions</td>
<td>Probability &amp; Counting <strong>Quiz #2</strong></td>
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<td>Fri, 6/20</td>
<td>Hypothesis testing &amp; confidence intervals</td>
<td>Chapters 9 &amp; 10</td>
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<td>Mon, 7/23</td>
<td>Project presentations and discussions</td>
<td><strong>Project #2 due at 8:30 am.</strong></td>
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<td>Tues. 7/24</td>
<td>(Comprehensive)</td>
<td><strong>Final Exam</strong></td>
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IX. CLASS POLICIES

**Attendance/Tardiness.** Since the course duration is limited, you’re expected to attend every class session, arrive on time, and complete all in-class activities. If you need to miss part or all of a class session, please contact me before class or as soon as possible. Email is usually best.

**Late Homework.** Homework will usually be due the next class. Late papers are not accepted.

**Cell Phones/Electronic Devices.** Please silence electronic devices during class and step out of class to use them. You may not use any personal electronic device during exams.

**Written Work.** Good writing skills are important in this class. Please type and proof-read written assignments. Note that the scoring rubric does require proper grammar and spelling.

**In-Class Discussion.** Everyone in the class is encouraged to express personal views with an emphasis on evidence-based claims and mutual respect.
Dropping a class. I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with me before you decide to drop to be sure it is the best thing to do. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance & participation WILL NOT automatically result in your being dropped from the class.

Academic integrity. University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a minimum of a 0 on the assignment or test.

Disabilities Accommodations. The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call or visit Disability Services at (361) 825-5816 in Corpus Christi Hall, Room 116.

Veterans. If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

Classroom Behavior. Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

Grade Appeals
A student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is on the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details on the process, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, consult Texas A&M University-Corpus Christi University Procedure 13.02.99.C2.01 Student Grade Appeal Procedures (http://www.tamucc.edu/provost/university_rules/index.html), and the College of Science and Engineering Grade Appeals webpage (http://sci.tamucc.edu/students/GradeAppeal.html). For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school or the College of Science and Engineering Dean’s Office.

Changes. The instructor may amend the syllabus at any time prior to the final exam by announcing the changes in class.