MTH 1342: Introduction to Probability and Statistics  
Fall 2023

Name: Mrs. Cook  
Department: Mathematics and Statistics  
Email: mmcook@sfasu.edu  
Phone: 936-468-1586  
Office: Math 335

Class meeting time and place:
Section .004 MWF 11:00-11:50 Room 206
Section .072 MWF 12:00-12:50 Room 206
Section .077 MW 2:15-3:45 Room 213
Section .008 TR 9:30-10:45 Room 202

Office Hours:
MWF: 1:00 - 1:50 pm
TR: 11:00 am – 12:15 pm
Additional times are available by appointment

Course Topics: Probability, random variables, mean and variance, binomial distribution, normal 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/MTH1342Syllabus.pdf

Course Materials: https://mostlyharmlessstat.wixsite.com/webpage/textbook

Calculator: A scientific calculator with statistics capabilities is required. Graphing calculators are permitted, but not required. TI-84 is best, but you can also get a TI-30 Multiview Calculator, or use the Calculate 84 App (Note, this app cannot be used during an exam, as no phones are allowed)

Other Supplies: A 2” binder, dividers, different colored highlighters, pencils

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

Grading Policy:
Grade Breakdown
The final course grade will be computed using the following weights:
Exam 1 - 3 60% (20% each)
Daily Work (may include quizzes) 20%
Comprehensive Final exam 20%

Daily Work
• At the beginning of class, you may ask questions on material covered the previous class period.
• You earn your grade by communicating your understanding of the material through the homework and tests. Clearly communicating mathematics will be essential in this course.
• I will send e-mails to the entire class during the semester. Check your SFA e-mail account frequently.
• 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.
• To contact me, you may call my office, drop by my office, or e-mail me. I will do my best to reply quickly.
• Students are expected to respect the learning environment of their fellow students. Towards this end, use of mobile phones, etc., is forbidden during class.

**Exams**
• If you miss a test and have a valid excuse, I will replace your missed test grade by your final exam grade. However, your final may only replace one other score.
• **Attendance Policy:** Over 3 unexcused absences may result in a grade reduction.
• Since you have a full semester to arrange any travel plans, they are not an excuse for missing the final.
• Students are expected to attend every class meeting, arriving on time. If you have 3 or less absences and score a 70% or better on the final, that score may replace your lowest test grade or your homework grade. If a student leaves class early without permission, the student will be marked absent.
• You may get help on work that is assigned to be done outside of class, unless otherwise instructed, but I expect any work that you turn in to reflect your understanding of the material. On in-class graded work, I expect you to only use your brains, pencil, paper, and, sometimes, a calculator.

**Final Exam**
The final exam is comprehensive and counts 20% toward the final grade. The final exam is mandatory.

**Resurrection Policy:** 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.

**Attendance Policy:** Attendance is expected. 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 468 - 4108, or the website [http://libweb.sfasu.edu/aarc](http://libweb.sfasu.edu/aarc). The AARC also has walk in tables available.

**Course Calendar / Outline:**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Approximate time spent</th>
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<tbody>
<tr>
<td></td>
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</tr>
<tr>
<td><strong>Descriptive Statistics [CO 1, 2, 3]</strong></td>
<td>10%</td>
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<tr>
<td></td>
<td>o Graphical Display of Data</td>
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<td></td>
<td>o Measures of location</td>
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<td></td>
<td>o Measures of Dispersion</td>
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<td><strong>Probability [CO 1, 2, 3]</strong></td>
<td>20%</td>
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<td></td>
<td>o Classical Probability</td>
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<td></td>
<td>o Probability Laws (Rules)</td>
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<td></td>
<td>o Counting Techniques</td>
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<tr>
<td><strong>Probability Distributions [CO 1, 2, 3]</strong></td>
<td>20%</td>
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<tr>
<td></td>
<td>o Random Variables</td>
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<td>o Discrete Distributions</td>
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<td></td>
<td>▪ Binomial Distribution</td>
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<td></td>
<td>▪ Hypergeometric Distribution</td>
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<td>o Continuous Distributions</td>
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<td></td>
<td>▪ Uniform Distribution</td>
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<td></td>
<td>▪ Normal Distribution</td>
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<tr>
<td><strong>Sampling Distributions [CO 1, 2, 3]</strong></td>
<td>10%</td>
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<td></td>
<td>o Random Samples</td>
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</tbody>
</table>
- 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 by thinking critically, communicating logically ordered solutions with complete and correct notation, and applying empirical or quantitative skills as appropriate to the problem. 5%

Program Learning Outcomes:
This is a general education core curriculum course and no specific program learning outcomes for this major are addressed in this course.

Student Learning Outcomes (SLO): At the end of MTH 1342, 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]

Per SFA policy 5.4, this schedule reflects that there is (1) an amount of student work per credit hour that reasonably approximates not less than one hour of class or direct faculty instruction and two hours of out-of-class student work per week for fifteen weeks over a long semester, 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.

General Education Core Curriculum
This course has been selected to be part of Stephen F. Austin State University’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.

By enrolling in Math 1342 you are also enrolling in a Core Curriculum Course that fulfills the Critical Thinking Skills, Communication Skills, or Empirical and Quantitative Skills requirement. You will see this course on your D2L list. At one point during the semester, you will receive an assignment that fulfills both the requirements of this course and the needs of Stephen F. Austin State University’s Core Curriculum Assessment Plan with the Texas Higher Education Coordinating Board. When you complete this one assignment, you need to upload the assignment to both your standard course dropbox determined by your Instructor and the “Core Curriculum” dropbox. The Core Curriculum dropbox will be identified by the Objective for which work is being collected. (Examples: Critical Thinking, Teamwork, Social Responsibility Empirical & Quantitative Skills, Personal Responsibility, Communication Skills-Written, Communication Skills-Written & Visual, and
Communication Skills- Oral & Visual.) Please note that this only applies to the approved assignment. All other assignments should be submitted according to regular class operations.

When you complete the assignment mentioned above, you will upload the assignment to both the Math 1342 dropbox and the Critical Thinking Skills, Communication Skills, or Empirical and Quantitative Skills dropbox.

Please note that this only applies to the specific assignment listed in the matrix below. All other assignments should be submitted according to regular class operations.

If you have any questions, please see your instructor, or contact the at Office of Student Learning and Institutional Assessment at (936) 468-1130.

The chart below indicates the core objectives addressed by this course, the assignment(s) that will be used to assess the objectives in this course and uploaded to the D2L Critical Thinking Skills, Communication Skills, or Empirical and Quantitative Skills dropbox this semester, and the date the assignment(s) should be uploaded to the D2L Critical Thinking Skills, Communication Skills, or Empirical and Quantitative Skills dropbox. Not every assignment will be submitted for core assessment every semester. Your instructor will notify you which assignment(s) must be submitted for assessment in the D2L Critical Thinking Skills, Communication Skills, or Empirical and Quantitative Skills dropbox.

<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>Hypothesis Testing Write Up</td>
<td>N/A</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 Write Up</td>
<td>N/A</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>Hypothesis Testing Write Up</td>
<td>N/A</td>
</tr>
</tbody>
</table>

- For Elements common to all sections see: [https://math.sfasu.edu/docs/syllabi/MATH1342Syllabus.pdf](https://math.sfasu.edu/docs/syllabi/MATH1342Syllabus.pdf)
<table>
<thead>
<tr>
<th>Week</th>
<th>Section</th>
<th>Topic(s)</th>
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</thead>
<tbody>
<tr>
<td>Week 1-2</td>
<td>4.7</td>
<td>Counting Techniques, Sets and Probabilities</td>
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<tr>
<td>Week 3</td>
<td>3.1-3.2, 2.3</td>
<td>Descriptive Statistics and Graphs</td>
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<td>Week 4</td>
<td>5.1-5.2</td>
<td>Discrete Random Variables</td>
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<td>Week 5</td>
<td>5.3-5.5</td>
<td>Binomial and Geometric Distributions</td>
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<td></td>
<td><strong>TEST 1 SEPT 21-22</strong></td>
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<tr>
<td>Week 6</td>
<td>6.1</td>
<td>Continuous Random Variables and Normal Distribution</td>
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<td>Week 7</td>
<td>6.1-6.3</td>
<td>Uniform Distribution and Exponential Distribution</td>
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<td>Week 8</td>
<td>6.4-6.5</td>
<td>Standard Normal and Sampling Distributions</td>
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<td>Week 9</td>
<td>12.1-12.2</td>
<td>Scatterplots, Correlation, Regression</td>
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<td>Week 10</td>
<td>7.1-7.2</td>
<td>Estimation and Confidence Intervals for Proportions</td>
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<td><strong>TEST 2 OCT 26-27</strong></td>
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<tr>
<td>Week 11</td>
<td>7.4-7.6</td>
<td>Confidence Intervals for Means</td>
</tr>
<tr>
<td>Week 12-13</td>
<td>8.1-8.4</td>
<td>Hypothesis tests for one sample mean or proportion</td>
</tr>
<tr>
<td>Week 13-14</td>
<td>9.1, 9.3,10.1-10.2</td>
<td>Hypothesis test for two or more samples and Chi-square Goodness of Fit test</td>
</tr>
<tr>
<td>Week 14</td>
<td>TEST 3 Nov 30- Dec 1</td>
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<tr>
<td>Week 15</td>
<td>Review</td>
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</tbody>
</table>

**Final Exam:**
- Section .004 December 11th 10:30 AM-12:30 PM
- Section .072 December 11th 1:00-3:00 PM
- Section .077 December 12th 1:00-3:00 PM
- Section .008 December 14th 8:00-10:00 AM
**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 or 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*