# Statistics for Business

$$\alpha \quad \beta \quad \mu \quad \neq \quad \leq \quad \geq \quad \sigma \quad \pm \quad = \quad \bar{x} \quad s^2 \quad \sum x_i$$

## Course Syllabus

**When we meet**     MWF 11:00 – 11:50 am
**Where we meet**     KWR 310

*As a departmental policy, the Department of Business is not providing synchronous WebEx access for students to attend class virtually.*

**Professor Name:**     Dr. Serina Al Haddad: shaddad@rollins.edu

**Office Location**     Fairbanks 203 + WebEx

**Student Hours:**

| | |
|---|---|
| Mondays | 3:00 – 4:00 pm |
| Wednesdays | 2:30 – 3:30 pm |
| Thursdays | 6:00 – 6:30 pm |
| Fridays | 10:00 – 10:30 am & 2:30 – 3:00 pm |

**Note:** I ask students during the first class if they can make it to at least one of the time slots and add new slots, if needed. I post my student hours on the course Canvas page.

For **other times and days,** please email me to schedule a meeting

Here is a summary of important information for this course. Please read everything. The links below will take you to specific information you need. ***Happy reading!***

## ROADMAP

**Note:** The below Headings are links to the actual section in the file.

**What this course is about**
**Topics we will cover**
**Required Material**
**What you can expect in the learning environment**
**How you will be graded**
**Our Learning Journey This Semester**
**Course Grading Scale**
**What we will cover each week**
**Frequently Asked Questions (FAQs)**

## What this course is about

It's all about "analyzing data and making smart decision based on data". Data are a critical element of understanding how the business world works. BUS236 introduces you to tools, techniques, and methods for **transforming data** into **useful information** for making **smart decisions**. This course will help you advance your quantitative skills, think critically and statistically, make valid assumptions, use appropriate methods to solve business problems, and effectively communicate your analyses.

The main goal of this course is that you will learn and be able to apply appropriate statistical procedures to provide insight into recommendations and/or solutions to various business problems and opportunities. In the long term, BUS 236 will help you develop a critical trait that managers need – *the ability to extract knowledge from a set of data* for the purpose of: shedding light on a business problem; improving a business process, enhancing the quality of a business strategy; building insight into a product's competitive advantage; or guiding a launch decision into a specific international market. The personal and professional development you will gain from this course will be worth the **consistent effort** required from you.

## Topics we will cover

Our objective is to obtain proficiency in:
- Descriptive statistics
- Probability theory and distributions
- Surveys and sampling concepts
- Estimation of populations parameters
- Hypothesis testing
- Linear regression

## Required Material

**Textbook:**

**Note:** I was the lead contributing author in this book. The book has been adopted by 50 schools in the USA. I will be a co-author on the 4th edition (2025).

Our main text is "**Business Statistics**" by Robert A. Donnelly (2020). There are 3 versions of the text that you can purchase depending on your budget or preference.
1. **Hardcover**: Business Statistics Plus NEW My Lab Statistics with Pearson eText -- Access Card Package.
2. **Loose Leaf**: A cheaper version. You put what you need in a ring binder. Business Statistics Student Value Edition Plus NEW My Lab Statistics with Pearson eText -- Access Card Package.
3. **Electronic:** If you are fine with just reading your book from your computer. NEW My Lab Statistics with Pearson eText -- Instant Access -- for Business Statistics. You could also just pay for an access code when you access My Lab Statistics from Canvas.

**Study Aids:**

Access to My Lab Statistics is included with the purchase of the text options above and is **mandatory**. It will help you to practice what we cover in class. You also need it to complete the homework assignments, quizzes, and tests.

**Note:** All math-based homework assignments as well as quizzes and tests are on MyLab Statistics. It serves as a study aid as there are built-in learning aids when assigning homework such as: help me solve this, view an example and "contact instructor", which generates an email that is sent to me with the detailed view of the question. MyLab also allows students to access a study plan where they can access additional practice question. In addition to extra practice questions, students have access to videos and other online resources.

## What you can expect in the learning environment

Together, we will create an environment in which we feel safe to learn new things and challenge ourselves to our highest potential. Statistics is a participation sport. Ask questions freely and contribute positively to the learning experience. I will always respect your opinion and value your questions.  You are responsible for all work covered in class, and prompt submissions regardless of excused absences.  To minimize distraction in our shared class environment, you can use your preferred electronic device to take notes, work with Excel, and look up additional information rather than other uses not directly related to BUS 236. You are expected to be punctual to class, work and communicate with other students during class and participate in solving/answering questions we work on during class. keep in mind that the more you are engaged, the more you will learn and benefit from the course. Our class time is inspired by the famous saying: "*Tell me and I forget, teach me and I may remember, involve me and I learn*" - Benjamin Franklin.

## How you will be graded

Your final grade will be composed of the following items and percentage points:
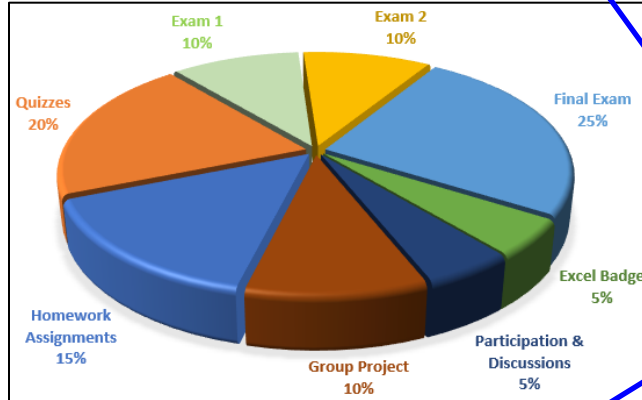
**Note:** Since the class is recorded, students who miss class can still watch the recording and submit the completed file. This has helped in creating an inclusive and equitable learning experience for students who miss class due to health/ personal issues or for collegiate events.

**Note:** I used to have one midterm until Fall 2021. After introducing 2 exams, students started feeling more relaxed when taking the exams, and grades started improving.

### Homework Assignments (15%)
HW assignments will be submitted **individually** on MyLab-Statistics. You have ***unlimited attempts*** to submit the homework assignment on MyLab before the due date.

### Quizzes (20%)
All quizzes will be on MyLab. They are designed to be *more challenging* that the homework assignments and mainly assess your preparation for the material to be treated on that topic, plus help you review. Quizzes will be open-book and taken **individually** as a **take-home** quiz. You have two attempts on quizzes. Give yourself sufficient time to study well and complete them on time.

### Exams (20%)
There will be two exams during the semester. They will assess your understanding of all the material covered up till that point in class. The questions will be similar to, but **more challenging** than the HW assignments and quiz questions.

### Final Exam (25%)
The final is a **cumulative** and **comprehensive** 2-hour exam covering work done over the whole semester. It will be helpful to have a good grasp of the end of chapter problems for each topic we treat in class.

### Excel Badge (5%)
MyLab IT Badges are free for students. You can earn it by scoring **90% or higher on a Capstone Grader Project** in My Lab IT. More details will be provided in class after the Exam 1.

### Participation and Reflection (5%)
The best way to engage in learning the material is participating in class. You are expected to be engaged, ask questions, and provide feedback during class. You will be required to work on datasets and upload them for a participation grade at the end of almost each class. You will be asked to work in small groups and share your answer with your classmates. You will have a brief reflection assignment at the end of each chapter where you are required to respond to a discussion posted on Canvas.

### Attendance:
You are expected to attend every class, but extenuating circumstances arise that can make this difficult. If you can't attend a class, please let know ahead of time (with relevant documentation, if available). You will receive 2 "free pass" absences for the semester. For each class you miss after that, your grade will be reduced by 1%.

### Extra Credit
There will be opportunities for extra credit during the semester.

**Note:** I frequently assign extra credit assignments during the semester. I always assign an extra credit assignment before the exams to encourage students to study and ask questions during the class preceding the exam.

**Group Project (10%)**
There will be one Group Project due before the end of the semester. Details of the project will be provided in class. Your team will present the research in class during the last week. An abstract must be submitted and approved before the team start the data collection process.  Using descriptive and inferential statistics concepts learned in class, teams of 5-6 students need to:
1. Consider a situation where statistical analysis is appropriate (confidence interval/hypothesis testing)
2. Develop a research question (3-4 sub-questions).
3. Gather data (sample) and address your research question.
4. Teams are required to present their research project in class (5-10 minutes). Further information will be given in class.

An **Abstract** should be 100-200 words and can be used as the final report introduction. Teams will be formed by Professor Haddad and will consist of 5-6 members to provide a balance of individual efforts and a shared participation experience.  Team members will be evaluated collectively based on their contributions, and also individually in a 360-degree review process which must be delivered within 48 hours of being sent to the members by Professor Haddad. Teams will present their research in class using a PowerPoint Presentation. The Research Project Presentation and Report should include *Introduction, research questions, descriptive analysis (at least 4 descriptive charts), inferential analysis (3 inferential analyses), conclusion and lessons learned.*

**Note:** I used to ask students to fill out an excel file and then I would combine and calculate all scored. In Fall 2022, I created and started using a Qualtrics survey to collect the data.
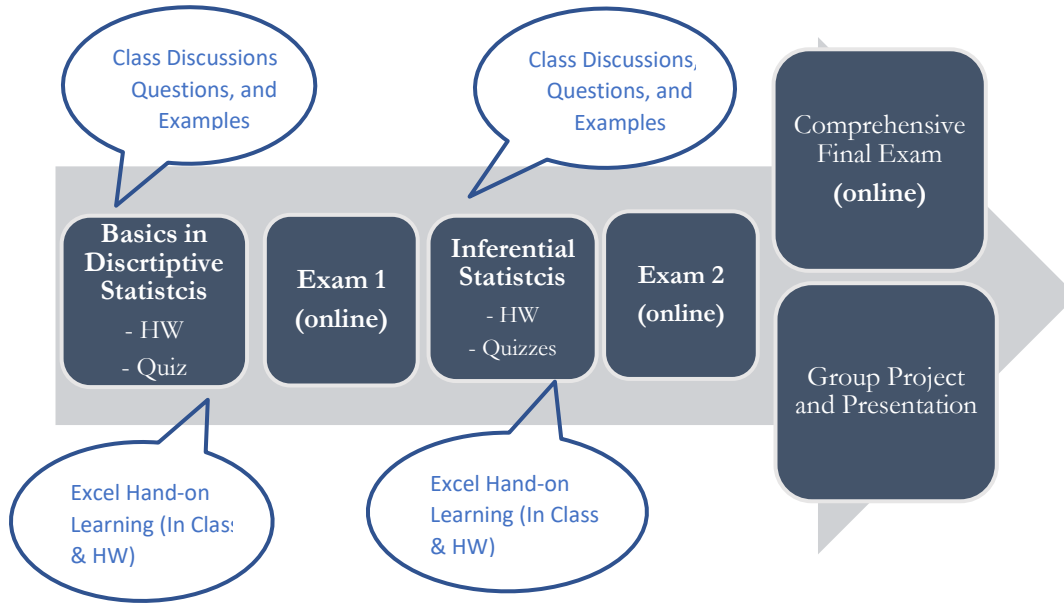
**Below are the formatting guidelines:**
- Limit number of presentation slides to 10 slides
- Limit number of pages to 5 (**1500-2000 words**)
- Use 11-point Cambria or Calibri or Arial (1.5-line spacing Single column)
- Tables and figures should be included in the main text, as close to the point of their introduction as possible with a clear title accompanying the table/figure.

**Below are the grading rubrics for the research paper and presentation**

| Category: Presentation | 100% | 75% | 50% | 25% |
|---|---|---|---|---|
| **A) Introduction/ Abstract/Research Questions**<br><br>____ / 5 points | Exceptional introduction that grabs interest of reader and states topic. Clear and well-developed research questions. | Proficient introduction that is interesting and states topic. Research questions are clear but somewhat arguable. | Basic introduction that states topic but lacks interest. Research questions are not clear. | Weak or no introduction of topic. research questions are weak, or missing. |
| **B) Descriptive Data analysis: four graphs**<br><br>___ / 10 points | Exceptionally clear and thorough graphs and analysis that support the research questions | Clear and good graphs and analysis that support the research questions | Somewhat clear and logical graphs and analysis | Missing graphs and analysis |
| **C) Inferential Data analysis: three inferential**<br><br>___ / 10 points | Clear and thorough inferential analysis that supports the research questions | Good inferential analysis that supports the research questions | Somewhat clear and logical inferential analysis | Missing inferential analysis |
| **D) Organization/Conclusion and Lessons Learned/Quality of Writing**<br><br>___ / 10 points | Excellent transitions between ideas, summary of topic with concluding ideas and lessons learned. No spelling errors | Good transitions between ideas, summary of topic with concluding ideas. May contain few spelling, and grammatical errors | Basic summary of topic with some final concluding ideas. Contains spelling, and grammatical errors | Lack of summary and lessons learned. Contains a lot of spelling, and grammatical errors |
| **E) Teamwork and Presentation Skills**<br><br>___ / 10 points | Speakers maintain excellent eye contact with the audience and use clear voice. | Speakers maintain good eye contact with the audience and use somewhat clear voice. | Speakers maintained somewhat good eye contact with the audience. | Speakers did not maintain good eye contact with the audience. |

| Category: Report | 100% | 75% | 50% | 25% |
|---|---|---|---|---|
| **A) Organization and data analysis**<br><br>___ / 20 points | Exceptionally clear, logical, mature, and thorough development of ideas with excellent transitions between ideas. Excellent analysis. | Clear and logical order that supports purpose with good transitions between and within paragraphs ideas. Good analysis. | Somewhat clear and logical development with basic transitions between and ideas. | Lacks development of ideas with weak or no transitions between and within ideas. |
| **C) Quality of Writing, Grammar and Mechanics**<br><br>___ / 20 points | Control of grammar, usage, and mechanics. Almost entirely free of spelling, punctuation, and grammatical errors. Report is between 1500-2000 words. | May contain few spelling, and grammatical errors, but does not affect the paper's readability. Report slightly exceeded 2000 words or is slightly below 1500. | Contains several spelling and grammatical errors which detract from the paper's readability. Report significantly exceeded 2000 words or is significantly below 1500. | So many spelling, punctuation, and grammar errors that the paper cannot be understood. Report significantly exceeded 2000 words or is significantly below 1500. |
| **D) Conclusion and Lessons Learned**<br><br>___ / 10 points | Excellent summary of topic with concluding ideas and lessons learned. | Good summary of topic with clear concluding ideas. | Basic summary of topic with some final concluding ideas. | Lack of summary and lessons learned. |

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## Our Learning Journey This Semester

Class Discussions Questions, and Examples

Class Discussions, Questions, and Examples

Comprehensive Final Exam **(online)**

**Basics in Discrtiptive Statistcis**
- HW
- Quiz

**Exam 1 (online)**

**Inferential Statistcis**
- HW
- Quizzes

**Exam 2 (online)**

Group Project and Presentation

Excel Hand-on Learning (In Class & HW)

Excel Hand-on Learning (In Class & HW)

Our goal is to move up in **Bloom's Taxonomy learning mode**l from "*remembering* and *understanding* definitions and basic concepts" all the way to "*applying* the knowledge by *analyzing* and *evaluating* statistical scenarios and *creating* your own research questions".
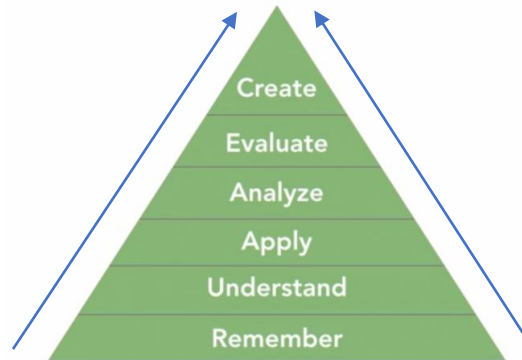


## Course Grading Scale

| | |
|---|---|
| ≥ 93.0% | A |
| 90.0% - 92.9% | A- |
| 87.0% - 89.9% | B+ |
| 83.0% - 86.9% | B |
| 80.0% - 82.9% | B- |
| 77.0% - 79.9% | C+ |
| 73.0% - 76.9% | C |
| 70.0% - 72.9% | C- |
| 67.0% - 69.9% | D+ |
| 63.0% - 66.9% | D |
| 60.0% - 62.9% | D- |
| ≤ 59.9% | F |

## What we will cover each week

The course schedule is *tentative,* and subject to reasonable changes based on the instructor's continuous evaluation of the course progression.

**Note:** I created a video and an accompanying Excel file to introduce students to Microsoft Excel and the basic functions needed during our first class. This has helped in addressing students' anxiety during class when we start working on Excel spreadsheets.

**Note:** Part a of the chapter's homework is usually Excel-based.

**Note:** The project abstract serves as a proposal. Students appreciate the fact that they get feedback on the project idea and analysis plan before starting to work on the project.

**Note:** We spend more than one week reviewing the content before our final exam, and this has helped in improving final exam grades over the last two semester.

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| Module | Date | Activities | Reading | Assignment due |
|---|---|---|---|---|
| **Introduction to Statistics and Excel** | Mon, Aug 22 | Introduction | Ch 1 | |
| | Wed, Aug 24 | Data Types - Excel | | Thurs: Canvas Intro to Excel H1a |
| | Fri, Aug 26 | Data Types | | Sunday: MyLab H1b |
| **Displaying Descriptive Statistics** | Mon, Aug 29 | Syllabus Quiz in class Intro to Displaying Data | Ch 2 | Monday**: MyLab Q1 +** Canvas Discussion |
| | Wed, Aug 31 | Displaying Quantitative Data | | Wed: MyLab H2a |
| | Fri, Sep 2 | Displaying Qualitative Data | | |
| | Mon, Sep 5 | Labor Day | | |
| **Calculating Descriptive Statistics** | Wed, Sep 7 | Calculating Descriptive Stats | Ch 3 | Tues: MyLab H2b Wed**: MyLab Q2 +** Canvas Discussion |
| | Fri, Sep 9 | Calculating Descriptive Stats | | |
| | Mon, Sep 12 | Calculating Descriptive Stats | | Sun: MyLab H3a + Tues: MyLab H3b |
| **Probability** | Wed, Sep 14 | Probability Rules | Ch 4 | Wed**: MyLab Q3 +** Canvas Discussion |
| | Fri, Sep 16 | Intro to Contingency Tables | | |
| | Mon, Sep 19 | Contingency Tables | | Tues: MyLab H4 |
| | Wed, Sep 21 | Mean and Standard Deviation | | Wed**: MyLab Q4 +** Canvas Discussion |
| **Discrete Probability Distribution** | Fri, Sep 23 | Binomial Distribution | Ch 5 | Sun: MyLab H5a |
| | Mon, Sep 26 | Poisson Distribution | | Tues: MyLab H5b |
| | Wed, Sep 28 | **Review** | Review Ch 1-5 | Wed**: MyLab Q5 +** Canvas Discussion |
| **Review & Exam 1** | Fri, Sep 30 | **Exam 1 (Ch 1-5)** | | |
| | Mon, Oct 3 | Exam 1 Wrap + Intro to Continuous Random Variables | Ch 6 | |
| | Wed, Oct 5 | Continuous Random Variables | | |
| **Continuous Probability Distribution** | Fri, Oct 7 | Normal Probability Distributions | | Friday: MyLab H6a |
| | Mon, Oct 10 | Fall Break | | |
| | Wed, Oct 12 | Sampling and Sampling Distribution | Ch 7 | Wed: **MyLab Q6 +** Canvas Discussion |
| **Sampling** | Fri, Oct 14 | Sampling in Excel | | Sun: MyLab H7 |
| | Mon, Oct 17 | Intro to Confidence Intervals | | Mon: **MyLab Q7** + Canvas Discussion |
| **Confidence Intervals - Single Population** | Wed, Oct 19 | Confidence Intervals: Mean | Ch 8 | |
| | Fri, Oct 21 | Confidence Intervals: Mean | | Fri: MyLab H8a + Sun: MyLab H8b |
| | Mon, Oct 24 | Confidence Intervals: Proportion | | Mon: **MyLab Q8a** |
| | Wed, Oct 26 | **Review** | Review Ch 6-8 | Tues: MyLab H8c + Wed: **MyLab Q8b** |
| **Review & Exam 2** | Fri, Oct 28 | **Exam 2 (Ch 6-8)** | | Canvas Discussion |
| | Mon, Oct 31 | Exam 2 Wrap + Intro to Hypothesis Testing | Ch 9 | |
| | Wed, Nov 2 | Hypothesis testing: Mean | | Thurs: **Project Abstract** |
| **Hypothesis Testing - Single Population** | Fri, Nov 4 | Hypothesis testing: Mean | | |
| | Mon, Nov 7 | Hypothesis testing: Proportion | | Sun: MyLab H9a + Mon: **MyLab Q9a** |
| | Wed, Nov 9 | Hypothesis testing: Proportion | | Thurs: MyLab H9b |
| | Fri, Nov 11 | Correlation + Intro to Regression | Ch 14,15 | Fri**: MyLab Q9b** + Sun: Canvas Discussion |
| **Regression Analysis** | Mon, Nov 14 | Regression Analysis | | |
| | Wed, Nov 16 | Regression Analysis | | Thurs: MyLab H10 |
| | Fri, Nov 18 | **Course Review** | Review Ch 1-9,14&15 | Fri**: MyLab Q10** + Tues: Canvas Discussion |
| | Mon, Nov 21 | **Course Review** | | |
| | Wed, Nov 23 | Thanksgiving Break | | |
| | Fri, Nov 25 | Thanksgiving Break | | |
| **Review** | Mon, Nov 28 | *Guest Speaker – tentative* | Review | Tues: Canvas Guest Speaker Reflection |
| | Wed, Nov 30 | **Presentations** | | Wednesday Before class: Presentations |
| | Fri, Dec 2 | **Course Review** | | Group Report |
| **Cumulative Final Exam: https://www.rollins.edu/registrar/exam-schedule/** | | | | |

**Important Dates:**

| | |
|---|---|
| Last Day to Drop a Course without transcript notation | Friday, September 2 |
| Labor Day Holiday (No Classes) | Monday, September 5 |
| Fall Break (No Classes for CLA only) | Monday October 10 – Tuesday October 11 |
| Last Day to Withdraw from a Course (W deadline) | Friday, November 4 |
| Thanksgiving Break | Wednesday, Nov 23, to Sunday, Nov 27 |
| One Time Credit/No Credit Deadline | Friday, December 2 |
| Final Exam | **11 am: Tuesday, Dec 6:** 2 p.m. – 4 p.m. |
| | **12 pm: Friday, Dec 9:** 11 a.m. – 1 p.m. |
| | **1 pm: Thursday, Dec 8:** 11 a.m. – 1 p.m. |

## Frequently Asked Questions (FAQs)

**How does Rollins view honor and integrity? What is the Honor code?**

Please visit Rollins College Academic Honor Code for detailed information.

**What does a four credit-hour course mean?**

The value of four credit hours results from work expected of enrolled students both inside and outside of the classroom. Rollins' faculty require that students average approximately 2 ½ hours of outside work for every hour of scheduled class time. In this course, the additional outside of class expectations are: MyLab Statistics activities (homework assignments and quizzes), Canvas discussions, and a group research project.

**Can I bring a recording device to class?**

Please visit Syllabi Statements for detailed information.

**What can I do if I need an academic accommodation?**

Please visit Syllabi Statements for detailed information.

**Do I have to always show up to class? What is Rollins policy regarding absences?**

Please visit Syllabi Statements for detailed information.

**What is Title IX?**

Please visit Syllabi Statements for detailed information.

**What can I do if I need extra help in this course?**

I highly encourage you to ask your classmates for extra help. You can also contact the Tutoring & Writing Center for a **free** one-to-one tutoring session at https://www.rollins.edu/library/twc/index.html. You can make an appointment with one of the tutors or writing consultants. Every semester, tutoring and consulting begins on the third week of classes. If you need extra Excel or technology-related help, please visit the Helpdesk or call them at 407.628.6363 and ask about their 1 credit-hour Excel course.

**Attendance Policy – Isolation/Quarantine (Temporary, AY 2022-23)**

The College aims to accommodate students who are isolated or quarantined due to COVID-19 exposure or infection, in order to minimize the potential spread of COVID-19 among the College's students, faculty, and staff. Students who must miss class due to COVID-19 isolation or quarantine orders will not have their course grade negatively affected by these absences.  Faculty will be notified of these absences by college officials. Students who receive their diagnosis or quarantine order from off-campus health care providers must contact the Wellness Center to have these absences communicated to faculty.  Students are reminded that lying to a faculty or staff member is considered a violation of the Academic Honor Code. Students remain responsible for all assigned work and will consult with instructors on the means of accommodation.

Excessive absences from class due to isolation/quarantine or other reasons can result in the student being unable to meet all of the learning objectives for a course. In such cases, students will consult with the Office of Student and Family Care to explore options such as a medical leave, incomplete course contract, or withdrawal from the course.

**Emergency Management**

Please visit Syllabi Statements for detailed information.

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