

Course Profile

| | |
|------------------------|----------------------------|
| Course Name:- | Probability and Statistics |
| Course Code:- | STAT 102 |
| Academic Year:- | 1434-1435 |
| Semester:- | Spring |

Course Overview

This course includes the following topics: Introduction to Sample space, Random events, Probability rules, Conditional probability, Baye's rule, Random variables, Definitions of Discrete and Continuous distributions, mean and variance of a random variable, and mean and variance of a linear combination of independent random variables. Discrete distributions (Binomial, Hyper geometric, Poisson) and continuous distributions (Uniform, Exponential, Normal), Sampling distributions of sample statistics: t-distribution, The concept of estimation methods: Point estimation and Confidence interval estimation, Concepts of Testing Hypotheses: Hypotheses testing of a single Population parameter (mean, proportion, difference between two means and difference between two proportions of independent populations), Concepts of simple linear correlation and linear regression.

Course Details

| | |
|-------------------------|----------|
| Level:- | 4 |
| Credit:- | 3(3,0,1) |
| Pre-Requisites:- | N/A |
| Co- Requisites:- | N/A |

Learning Outcomes of Course

The student is expected to be able to:

1. Apply probability rules and independent random events.
2. Use random variables and their probability distribution.
3. Use discrete probability distributions and their relationships.
4. Use continuous probability distributions and their applications.
5. Apply sampling distribution of sample statistics.
6. Understand the principles of estimation and estimation of population parameters.
7. Understand the principles of estimation of simple linear regressions.

Course Assessment

| Name of Assessment Task | Weight of Assessment | Week Due |
|-------------------------------|----------------------|----------|
| 1. Midterm Exam-1 | 15% | Week 8 |
| 2. Midterm Exam-2 | 15% | Week 13 |
| 3. Quizzes | 15% | |
| 4. Assignments/Report/Seminar | 15% | |
| 5. Final Exam | 40% | Week16 |

Assessment Task and Learning Outcomes Alignment

| Assessment Task Name | Course Learning Outcomes | | | | | | |
|-------------------------------|--------------------------|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1. Midterm Exam-1 | √ | √ | √ | | | | |
| 2. Midterm Exam-2 | | | | √ | √ | √ | |
| 3. Quizzes | √ | √ | | √ | √ | √ | |
| 4. Assignments/Report/Seminar | √ | √ | √ | √ | √ | √ | √ |
| 5. Final Exam | √ | √ | √ | √ | √ | √ | √ |

Teaching Contact Details

| | |
|---|--|
| Name of Course Coordinator:- | Eyad Haj Said |
| Email of Course Coordinator:- | eh.said@mu.edu.sa |
| Lab/Tutorial Instructor:- | Ahsan Ahmad |
| Email of Lab/Tutorial Instructor:- | a.ahmed@mu.edu.sa |
| Office Hours:- | Sun: 9:00am – 12:00pm, or by appointment |
| Office Number:- | 24-1-14-3 |
| Office Phone Number:- | 16 4042597 |

Details of Required Text Book

| Book Name | Authors Name | Publisher | Year | Edition |
|---|--|-----------|------|-------------------------|
| Probability and Statistics for Engineers and Scientists | Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers and Keying E. Ye Andrew Green | Pearson | 2011 | 9 th Edition |

Details of Required Reference Books

| Book Name | Authors Name | Publisher | Year | Edition |
|--|-------------------------------------|-----------|------|-------------------------|
| Applied Statistics and Probability for Engineers | Douglas C. Montgomery and, George C | Wiley | 2013 | 6 th Edition |

IT Resources

You will need access to the following IT resources:

- MU University Student Email
- Internet
- Course Website
- Matlab

Course Schedule

| Course Topics | Book's Chapter | Event Name | Week Due |
|---|----------------|---------------------------------------|------------|
| Introduction to Sample space, Random events, Probability rules, Conditional probability, Baye's rule | Chapter 1-2 | | Week 1-2-3 |
| Random variables, Definitions of Discrete and Continuous distributions, mean and variance of a random variable, and | Chapter 3-4 | Assigement1 Quiz-1 | Week -4 |
| Mean and variance of a linear combination of independent random variables. | Chapter 4 | Assigement2 | Week 5-6 |
| Discrete distributions (Binomial, Hyper geometric, Poisson) | Chapter 5 | Midterm-1 (Week-7) Assignment 3 | Week 7-8-9 |
| Continuous distributions (Uniform, Exponential, Normal) | Chapter 6 | Quiz 2 | Week 10 |
| Sampling distributions of sample statistics: t-distribution | Chapter 8 | Assignment 4 | Week11 |
| The concept of estimation methods: Point estimation and Confidence interval | Chapter 9 | Assignment 5 | Week 12 |

| | | | |
|--|------------|---|------------|
| estimation, Concepts of Testing | | Quiz 3 (Week 12) | |
| Hypotheses: Hypotheses testing of a single Population parameter (mean, proportion, difference between two means and difference between two proportions of independent populations) | Chapter 10 | Assignment 6 Midterm-2 (Week 13) Quiz 4 (Week 14) | Week 13-14 |
| Concepts of simple linear correlation and linear regression. | Chapter 11 | | Week 15 |
| | | Final Exam | Week 16 |

Referencing Style

American Psychological Association (APA)

Course Assessment Task

| | |
|---|---|
| Assessment Name:- | Midterm Exam-1 |
| Description of Task Assessment:- | This assignment is aligned to learning outcomes 1, 2 and 3. In that regard, the assignment contains questions that assess: <ol style="list-style-type: none"> 1. Apply probability rules and independent random events. 2. Use random variables and their probability distribution. 3. Use discrete probability distributions and their relationships. |
| Task Assessment Due Week/Date:- | Week 8 |
| Return Week/Date to Students:- | Week 9 |
| Weight of Task Assessment:- | 15% |
| List of Learning Outcomes Assessed:- | <ol style="list-style-type: none"> 1. Apply probability rules and independent random events. 2. Use random variables and their probability distribution. 3. Use discrete probability distributions and their relationships. |

| | |
|---|--|
| Assessment Name:- | Midterm Exam-2 |
| Description of Task Assessment:- | This assignment is aligned to learning outcomes 4, 5 and 6. In that regard, the assignment contains questions that assess: |

| | |
|---|--|
| | <ol style="list-style-type: none"> 4. Use continuous probability distributions and their applications. 5. Apply sampling distribution of sample statistics. 6. Understand the principles of estimation and estimation of population parameters. |
| Task Assessment Due Week/Date:- | Week 13 |
| Return Week/Date to Students:- | Week 14 |
| Weight of Task Assessment:- | 15% |
| List of Learning Outcomes Assessed:- | <ol style="list-style-type: none"> 1. Use continuous probability distributions and their applications. 2. Apply sampling distribution of sample statistics. 3. Understand the principles of estimation and estimation of population parameters. |

| | |
|---|--|
| Assessment Name:- | Final Exam |
| Weight of Task Assessment:- | 40% |
| Duration:- | 180 Minutes |
| Warning:- | <p>Dictionary - non-electronic, concise, direct translation only (dictionary must not contain any notes or comments)</p> <p>Calculator Permitted</p> <p>Closed Books</p> |
| List of Learning Outcomes Assessed:- | <ol style="list-style-type: none"> 1. Apply probability rules and independent random events. 2. Use random variables and their probability distribution. 3. Use discrete probability distributions and their relationships. 4. Use continuous probability distributions and their applications. 5. Apply sampling distribution of sample statistics. 6. Understand the principles of estimation and estimation of population parameters. 7. Understand the principles of estimation of simple linear regressions. |