Department of Industrial and Systems Engineering IEGR 251.01: Probability and Statistics for Engineers I (Fall 2021)

Catalog Description:

This course includes introduction to statistics and data analysis, importance of probability and statistics to engineers, descriptive statistics, inferential statistics, introduction probability, probability laws, discrete and continuous random variables and probability distributions, and mathematical expectations.

Credits: 3(3-0) Prerequisites: MATH 241 Prerequisites by Topic: Calculus I

Instructor: Masud Salimian, PhD SEB 318; Ext. 4241; Email: masud.salimian@morgan.edu https://salimian.webersedu.com/

Textbook:

No specific textbook is required, however, it is strongly recommended that you either buy or borrow from the library an introduction to probability and statistics textbook. Here are some examples:

Introduction to Probability and Statistics (Giri) [Link] Introduction to Probability and Statistics (Lindgren, McElrath, and Berry) [Link] Introduction to Probability and Statistics (Mendenhall and Beaver) [Link] Introduction to Probability and Statistics for Engineers and Scientists (Ross) [Link] An Introduction to Probability and Statistics (Rohatgi and Ehsanes Saleh) [Link]

Course Learning Objectives:

This course will equip the student with statistical tools that can be used for data analysis. It will also prepare students for graduate studies in engineering, business, science, or mathematics. On completion of this course, the student will be able to:

- 1. Describe data graphically, understand variability and relative standing (percentiles).
- 2. Communicate the concept of probability and the laws associated with it.
- 3. Understand the concept of random variables, their distributions, and applications to solve engineering problems.
- 4. Gain fundamental knowledge required in courses such as design of experiments, quality and reliability, etc.

Topics:

- 1. Role of statistics in engineering
- 2. Organization and description of data
 - Frequency Distributions
 - Histograms

- Stem-and-leaf-displays
- Descriptive measures
- Box plots
- 3. Probability
- 4. Probability distributions
- 5. Probability Densities
- 6. Sampling Distribution
- 7. Introduction to Hypothesis Testing
- 8. Introduction to Regression Analysis

Class Schedule:

The class will meet on Tuesday from 9:00-10:50 and Thursday from 9:00am – 9:50am.

Relationship of Course to Program Educational Objectives:

This course assists in achieving the following objectives of the BSIE Program:

Objective No.	Description
1	Prepare students to apply an exemplary foundation in the basic sciences, computer technology and engineering methods to solving industrial as well as manufacturing engineering problems.
6	Prepare students to readily communicate complex technical information to a wide variety of audiences in both written and oral form.
7	Provide students with tools to continue their professional development and life-long learning.

Grade Evaluation:

The weights for each type of evaluation are given below:

Category	Weight
In-class Assignments	30%
Midterm	30%
Final Exam	40%

Grading Scheme:

The following grading scheme shows the final percentages needed to complete the course with the specified letter grade.

Percentage	Grade
90-100	А
80-89	В
70-79	С
0-69	F

Office Hours:

Both regular and online office hours are available. Please check the instructor web site for details.

Course Policies:

Attendance

- Students are expected to be in class and on-time.
- If a student misses' excessive classes, they will fail the course according to the student handbook.
- Students not being able to attend should provide prior notice to the instructor and subsequent official documentation.
- If you are late 3 times that is considered 1 absence.
- If the lecture has begun, you are considered late.
- If no prior arrangement has been made and neither I nor a substitute instructor has arrived by 15 minutes after the scheduled start of class, the students may leave.

Grading Objections

• All objections to grades should be made <u>in writing within one day</u> of the work in question being returned. Objections made after this period has elapsed will <u>not</u> be considered.

General Classroom Policies

- Students are encouraged to participate in all class sessions.
- Mobile phones, pagers, *etc.* **MUST** be silenced during all classroom lectures and examinations. Those not heeding this rule will be asked to leave the classroom immediately so as to not disrupt the learning environment.
- Each student is responsible for all announcements made in class, sent to your MSU e-mail account and posted on the course web site. This includes scheduling of exams and homework assignments.
- There will be a 5-minute period during the class session where questions concerning assignments can be asked. After that, additional questions and points of clarification can be made on an individual basis during office hours.
- Students should conduct themselves in a manner that exemplifies the values, achievement, self-determination, and respect statements of the university.
- Failure to observe the classroom policies may adversely affect your grade.

Computer Skills/Usage

- Google group will be used to communicate with students throughout the course. Lecture materials, and quizzes will be posted on the course web site.
- Some lectures maybe recorded via Google Meet with the recording available on a shared drive.

Extra Credit

• Do not expect extra credit assignments. Please submit the work assigned to ensure that you maximize your grade for this class.

Inclass/Homework Assignments

- During the semester several assignments will be assigned. These projects are simply small assignments that you can work on that will help to reinforce the material. The assignments will vary in style. Assignments will be posted to the course web site.
- Points will be assigned based on a pre-defined set of criteria (rubric).
- Only assignments identified as such can be emailed. All paper assignment must be submitted in my office. No assignment will be collected or accepted in class.
- No late work will be accepted.

Examinations

- All examinations will be taken in class
- Students will be notified of the exam date at least **one** week earlier you can also refer to the schedule found on the syllabus page in the course web site.
- Exams will be graded based on a pre-defined set of criteria (rubric)

Makeup Assignments/Examinations

- There will be no makeup assignments given.
- Makeup exams will be given at a date announced by the instructor for special circumstances. The makeup exams may be different and more challenging than those administered on the original date.

Tentative Schedule

Course Topics	Weeks
Role of Statistics in Engineering	Week 1
Describing Data Graphically and Numerically	Weeks 2-3
Probability	Weeks 4-7
Probability Distributions	Weeks 8-11
Probability Densities	Week 11-13

********Schedule subject to change