湖北工業大學
HUBEI UNIVERSITY OF TECHNOLOGY

Course Title	Applied Statistics
Course Code	STAT 1913
Semester	Spring 2027
Course Length	8 Weeks, 60 Contact Hours
Credits	4
Instructor	TBA
Office	TBA
Email	TBA
Prerequisite	N/A
Antirequisite	STAT 1911 Applied Statistics (4 Weeks)

Course Description:

This course introduces students to the fundamental concepts and techniques of applied statistics. Topics include data collection, descriptive statistics, probability, statistical inference, hypothesis testing, correlation, regression analysis, and analysis of variance (ANOVA). The course emphasizes the application of statistical methods to real-world problems and includes hands-on experience with statistical software.

Course Goals:

Students who successfully complete this course will demonstrate competency in the following general education core goals:

- **Critical thinking skills** – Students will engage in creative and/or innovative thinking, and/or inquiry, analysis, evaluation, synthesis of information, organizing concepts, and constructing solutions.
- **Communication skills** – Students will demonstrate effective written, oral, and visual communication.
- **Teamwork** – Students will demonstrate the ability to work effectively with others to support a shared purpose or goal and consider different points of view.
- **Social responsibility** – Students will demonstrate intercultural competency and civic knowledge by engaging effectively in local, regional, national, and global communities.

Student Learning Outcomes:

Upon completion of this course, students will be able to:

- collect, organize, and summarize data using appropriate graphical and numerical techniques;
- understand and apply basic probability concepts;

- perform statistical inference, including hypothesis testing and confidence intervals;
- analyze relationships between variables using correlation and regression;
- use statistical software to analyze data and interpret results.

Textbooks/Supplies/Materials/Equipment/ Technology or Technical Requirements:

Introduction to Statistics & Data Analysis (6th Edition) by Roxy Peck, Chris Olsen, Tom Short. Cengage Learning.

Course Requirements:

Homework Assignments (20%)
Homework assignments will consist of problems that reinforce the material covered in lectures. There will be 10 homework assignments throughout the semester, each focusing on specific topics such as descriptive statistics, probability, hypothesis testing, and regression analysis. Students are expected to complete these assignments independently, and late submissions will not be accepted. The homework assignments are designed to help students practice and master the course material, and they will contribute 20% to the final grade.

Case Study (15%)
Students will engage in a comprehensive case study designed to apply statistical methods to real-world scenarios. The case study will be completed in small groups, encouraging collaboration and the application of theoretical knowledge to practical problems. Each group will be assigned a dataset related to a real-world issue (e.g., public health, economics, environmental studies). Students will be required to analyze the data using statistical techniques learned in class, such as hypothesis testing, regression analysis, and ANOVA.
Deliverables: Groups will submit a detailed written report summarizing their methodology, findings, and interpretations. The report should include data visualizations, statistical analysis, and a discussion on the implications of the results.
Presentation: Each group will also give a brief presentation of their findings to the class, highlighting key insights and the statistical methods used.

Midterm Exam (25%)
The midterm exam will be a 90-minute exam covering the material from the first half of the course. The exam will consist of multiple-choice questions, short-answer questions, and problem-solving tasks. The midterm exam will contribute 25% to the final grade.

Final Exam (40%)
The final exam will be a cumulative, 180-minute exam covering all topics from the course, including material from both the first and second halves of the semester. The exam will consist of multiple-choice questions, short-answer questions, and problem-solving tasks, with an emphasis on applying statistical methods to real-world scenarios. The final exam will contribute 40% to the final grade.

Assessments: Activity	Percent Contribution
Homework Assignments	20%
Case Study	15%
Midterm Exam	25%
Final Exam	40%

Grading:

Final grades will be based on the sum of all possible course points as noted above.

Grade	Percentage of available points
A	94-100
A-	90-93
B+	87-89
B	84-86
B-	80-83
C+	77-79
C	74-76
C-	70-73
D	64-69
D-	60-63
F	0-59

Course Schedule:

The schedule of activities is subject to change at the reasonable discretion of the instructor. Minor changes will be announced in class, major ones provided in writing.

STAT 1913 Schedule

Lecture	Topic	Readings/ Activities
L1	Syllabus Overview Introduction to Statistics Overview of statistics, data types, and the role of statistics in decision-making	Chapter 1
L2	Data Collection and Sampling Methods	Chapter 2
L3	Descriptive Statistics: Graphical Methods	Chapter 3
L4	Descriptive Statistics: Numerical Methods	Chapter 3
L5	Probability Basics Probability rules, conditional probability, and independence	Chapter 4
L6	Discrete Probability Distributions	Chapter 5
L7	Continuous Probability Distributions	Chapter 6
L8	Sampling Distributions Central Limit Theorem and sampling distribution of the mean	Chapter 7
L9	Confidence Intervals for Proportions	Chapter 9
L10	Hypothesis Testing for Proportions One-sample and two-sample hypothesis tests for proportions	Chapter 10
L11	Confidence Intervals for Means	Chapter 11
L12	Hypothesis Testing for Means One-sample and two-sample hypothesis tests for means	Chapter 11
L13	Review and Midterm Preparation Comprehensive review of Lectures 1-12	---

	Practice problems and exam preparation	
L14	**Midterm Exam**	---
L15	Chi-Square Tests Chi-square tests for goodness of fit and independence	Chapter 12
L16	Analysis of Variance (ANOVA) One-way ANOVA and multiple comparisons	Chapter 13
L17	Simple Linear Regression Correlation, regression lines, and interpretation of slope and intercept	Chapter 14
L18	Multiple Regression Multiple regression models and interpretation of coefficients	Chapter 14
L19	Applications of Statistical Methods	Case studies and real-world applications
L20	Advanced Topics in Regression Residual analysis and model diagnostics	Chapter 14
L21	Advanced Topics in ANOVA Two-way ANOVA and interaction effects	Chapter 13
L22	Nonparametric Methods	Chapter 15
L23	Statistical Quality Control	Chapter 16
L24	Case Study Presentations	---
L25	**Final Exam**	---

Accommodation Statement:

Academic accommodations may be made for any student who notifies the instructor of the need for an accommodation. It is imperative that you take the initiative to bring such needs to the instructor's attention. Students who may require assistance in emergency evacuations should contact the instructor as to the most appropriate procedures to follow.

Academic Integrity Statement

Each student is expected to maintain the highest standards of honesty and integrity in academic and professional matters. The University reserves the right to take disciplinary action, up to and including dismissal, against any student who is found guilty of academic dishonesty or otherwise fails to meet the standards. Any student judged to have engaged in academic dishonesty in coursework may receive a reduced or failing grade for the work in question and/or for the course.

Academic dishonesty includes, but is not limited to, dishonesty in quizzes, tests, or assignments; claiming credit for work not done or done by others; hindering the academic work of other students; misrepresenting academic or professional qualifications within or without the University; and nondisclosure or misrepresentation in filling out applications or other University records.

Other Items:

Attendance and Expectations

All students are required to attend every class, except in cases of illness, serious family concerns, or other major problems. We expect that students will arrive on time,

be prepared to listen and participate as appropriate, and stay for the duration of a meeting rather than drift in or out casually. In short, we anticipate that students will show professors and fellow students maximum consideration by minimizing the disturbances that cause interruptions in the learning process. This means that punctuality is a must, that cellular phones be turned off, and that courtesy is the guiding principle in all exchanges among students and faculty. You will be responsible for the materials and ideas presented in the lecture.

Assignment Due Dates
All written assignments must be turned in at the time specified. Late assignments will not be accepted unless prior information has been obtained from the instructor. If you believe you have extenuating circumstances, please contact the instructor as soon as possible.

Make-Up Work
The instructor will not provide students with class information or make-up assignments/quizzes/exams missed due to an unexcused absence. Absences will be excused and assignments/quizzes/exams may be made up only with written documentation of an authorized absence. Every effort should be made to avoid scheduling appointments during class. An excused student is responsible for requesting any missed information from the instructor and setting up any necessary appointments outside of class.

Access, Special Needs and Disabilities
Please notify the instructor at the start of the semester if you have any documented disabilities, a medical issue, or any special circumstances that require attention, and the school will be happy to assist.