

School of Engineering and Applied Sciences

**SEAS 271 INDUSTRIAL STATISTICS**

**Fall 2022: Web**

Dr. Greg Arbuckle

EST 210

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**OFFICE HOURS:**

8:00 – 10:30 (TR)

**CATALOG DESCRIPTION:**

Prerequisite: MATH 116

A study of statistical techniques used in industry for purposes of Statistical Process Control, material science research, and system planning and operation.

**REQUIRED TEXTS:**

Besterfield, D.H. (2013). Quality Improvement 9<sup>th</sup> Ed. Pearson Prentice Hall, Upper Saddle River, NJ.

**COURSE OBJECTIVES:**

This course will enable the student to: become aware of the overall industrial environment; gain an appreciation of the importance of Quality Control; utilize methods of establishing a Quality Control System; demonstrate the use of analytical tools in Quality Control; discuss quality concepts as related to profitability and customer satisfaction; and identify the effect of product reliability to product liability.

**COURSE TOPICS:**

1. Introduction to Quality
  - a. Introduction
  - b. Responsibility
2. Fundamental of Statistics
  - a. Frequency Distribution
  - b. Measures of Central Tendency
  - c. Measures of Dispersion
  - d. Concept of Population and Sample
  - e. The Normal Curve
  - f. Tests for Normality
3. Control Charts for Variables
  - a. Control Chart Techniques
  - b. State of Control
  - c. Specifications
  - d. Process Capability
  - e. Different Control Charts
4. SPC Techniques for Variables
  - a. Continuous and Batch Processes

- b. Multi-Vari Chart
  - c. Short-Run SPC
  - d. Gage Control
5. Fundamentals of Probability
    - a. Discrete Probability Distributions
    - b. Continuous Probability Distributions
    - c. Distribution Interrelationship
  6. Control Charts for Attributes
    - a. Control Charts for Nonconforming Units
    - b. Control Charts for Count of Nonconformities
    - c. A Quality Rating System
  7. Lot-by-Lot Acceptance Sampling by Attributes
    - a. Fundamental Concepts
    - b. Statistical Aspects
    - c. Sampling Plan Design
  8. Acceptance Sampling Systems
    - a. Lot-by-Lot Acceptance Sampling Plans for Attributes
    - b. Acceptance Sampling Plans for Continuous Production
    - c. Acceptance Sampling Plans for Variables
  9. Reliability
    - a. Fundamental Aspects
    - b. Additional Statistical Aspects
    - c. Life and Reliability Testing Plans
    - d. Availability and Maintainability

**GRADING:**

Quizzes	20%
Homework	20%
Test 1	20%
Test 2	20%
Test 3	20%

NO LATE ASSIGNMENTS WILL BE GRADED UNLESS PRIOR APPROVAL HAS BEEN GRANTED BY THE INSTRUCTOR.

**GRADES BREAKDOWN:**

90 – 100%	= A
80 – 89%	= B
70 – 79%	= C
60 – 69%	= D
0 – 59%	= F

### **Title IX Misconduct/Assault Statement**

Western Kentucky University (WKU) is committed to supporting faculty, staff and students by upholding WKU's Title IX Sexual Misconduct/Assault Policy (#0.2070) at <https://wku.edu/eoo/documents/titleix/wkutitleixpolicyandgrievanceprocedure.pdf> and Discrimination and Harassment Policy (#0.2040) at [https://wku.edu/policies/hr\\_policies/2040\\_discrimination\\_harassment\\_policy.pdf](https://wku.edu/policies/hr_policies/2040_discrimination_harassment_policy.pdf). Under these policies, discrimination, harassment and/or sexual misconduct based on sex/gender are prohibited. If you experience an incident of sex/gender-based discrimination, harassment and/or sexual misconduct, you are encouraged to report it to the Title IX Coordinator, Andrea Anderson, 270-745-5398 or Title IX Investigators, Michael Crowe, 270-745- 5429 or Joshua Hayes, 270-745-5121. Please note that while you may report an incident of sex/gender based discrimination, harassment and/or sexual misconduct to a faculty member, WKU faculty are "Responsible Employees" of the University and MUST report what you share to WKU's Title IX Coordinator or Title IX Investigator. If you would like to speak with someone who may be able to afford you confidentiality, you may contact WKU's Counseling and Testing Center at 270-745-3159.

### **Ogden Student Course Attendance Statement**

The faculty and staff of Ogden College of Science and Engineering are committed to providing you with learning experiences and opportunities. You must assume ownership of your education and be an active participant in the classroom and laboratory to take advantage of these opportunities. Active participation requires you to attend. Scientific studies have shown that attendance during scheduled classroom and laboratory meetings is directly correlated to your performance on assignments and exams and the potential to earn higher grades. Additionally, if you do not regularly attend class, you are missing important information about course topics, due dates, and assignment details that are crucial to your success in the course. Therefore, as a student enrolled in an Ogden course, you are expected to attend every class meeting and to inform your instructor regarding the reasons for any absences as soon as practical. Your instructor may incorporate class attendance/participation as part of the grading criteria.

### **ADA Accommodation Statement**

In compliance with University policy, students with disabilities who require academic and/or auxiliary accommodations for this course must contact the Student Accessibility Resource Center located in Downing Student Union, 1074. SARC can be reached by phone number at 270-745-5004 [270-745-3030 TTY] or via email at [sarc.connect@wku.edu](mailto:sarc.connect@wku.edu) . Please do not request accommodations directly from the professor or instructor without a faculty notification letter (FNL) from The Student Accessibility Resource Center.

All students are strongly encouraged to [get the COVID-19 vaccine](#). In accordance with WKU policy, all students must call the WKU COVID-19 Assistance Line at 270-745-2019 within 4 hours of testing positive for COVID-19 or being identified as a close contact to someone who has tested positive. The COVID Assistance Line is available to answer questions regarding any COVID-19 related issue. This guidance is subject to change based on requirements set forth by federal, state, and local public health entities. Please

refer to the Healthy on the Hill website for the most current information. [www.wku.edu/healthyonthehill](http://www.wku.edu/healthyonthehill)

The U.S. Department of Education requires that distance education courses must include regular and substantive interaction between students and faculty. For more information about Regular and Substantive Interaction at WKU, please visit the [Regular and Substantive Interaction in Online and Distance Learning webpage](#).

In this course, regular and substantive interaction will take place in the following ways:

- Weekly synchronous sessions with faculty and students,
- Regular announcements, and
- Timely and detailed feedback on assignments provided within one week of submission.